

Exhibit 3.18: Kent County Fixed-Route Operating Statistics (2002-2007)

Measure	2002	2003	2004	2005	2006	2007	2008
Miles	408,430	408,528	426,806	486,068	471,537	462,295	461,124
Hours	30,933	30,820	31,674	35,943	35,924	35,725	35,558
Passenger trips	308,716	303,914	308,759	340,856	364,781	376,223	409,942
Trips/mile	0.76	0.74	0.72	0.70	0.77	0.81	0.89
Trips/hour	9.98	9.86	9.75	9.48	10.15	10.53	11.53

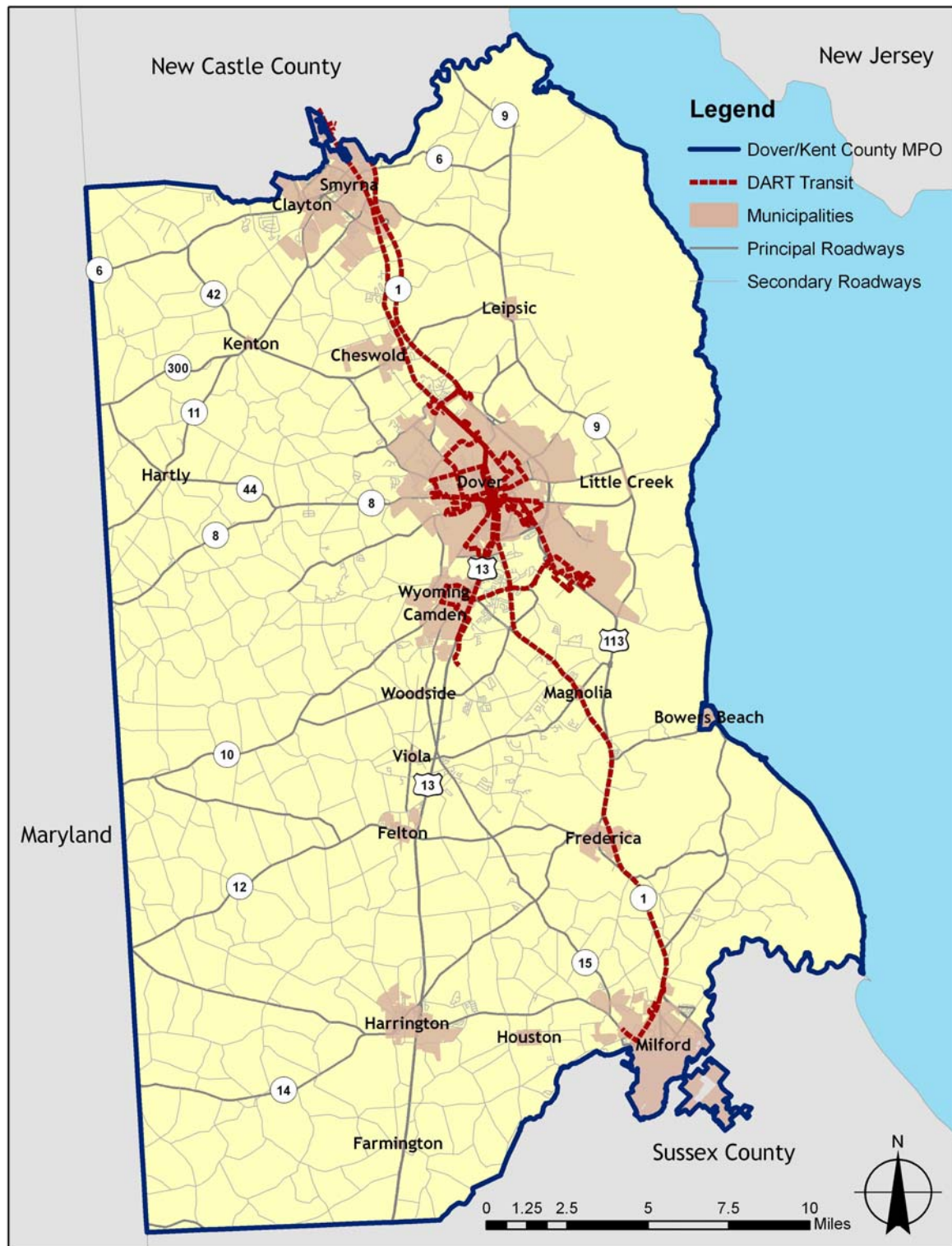
Source: Delaware Transit Corporation

In terms of future expansion plans, DART has outgrown the Water Street transit hub and has purchased the former George and Lynch property at Water and Queen Streets, to support a new transit center in Dover. With conceptual plans completed in 2005, the new transit center is expected to significantly improve passenger facilities including an indoor waiting room, ticket sales, real time passenger information, and other amenities. In addition to supporting DART's local, paratransit, and intercounty services, the transit center will support privately-run intercity bus services. The site is adjacent to the Norfolk Southern railroad and has been identified as the future Dover Station for downstate commuter rail.

Bus expansion proposals for Kent County listed in DTC's Business Plan for FY2008-2013 include Smyrna-Cheswold-Dover service (2011) to support growth in these areas, and to meet additional demand for local service, including commuters to and from Dover. In addition to the Saturday service begun in Kent County as previously described, proposed is the addition of Sunday service statewide in 2015. Intercounty service expansions are also proposed, to increase the frequency of service to meet growth and demand in New Castle and Kent counties. This would include specific intercounty service between Glasgow-Newark-Dover (2013) to serve as a regional connection for growth in southwestern New Castle County and Dover.

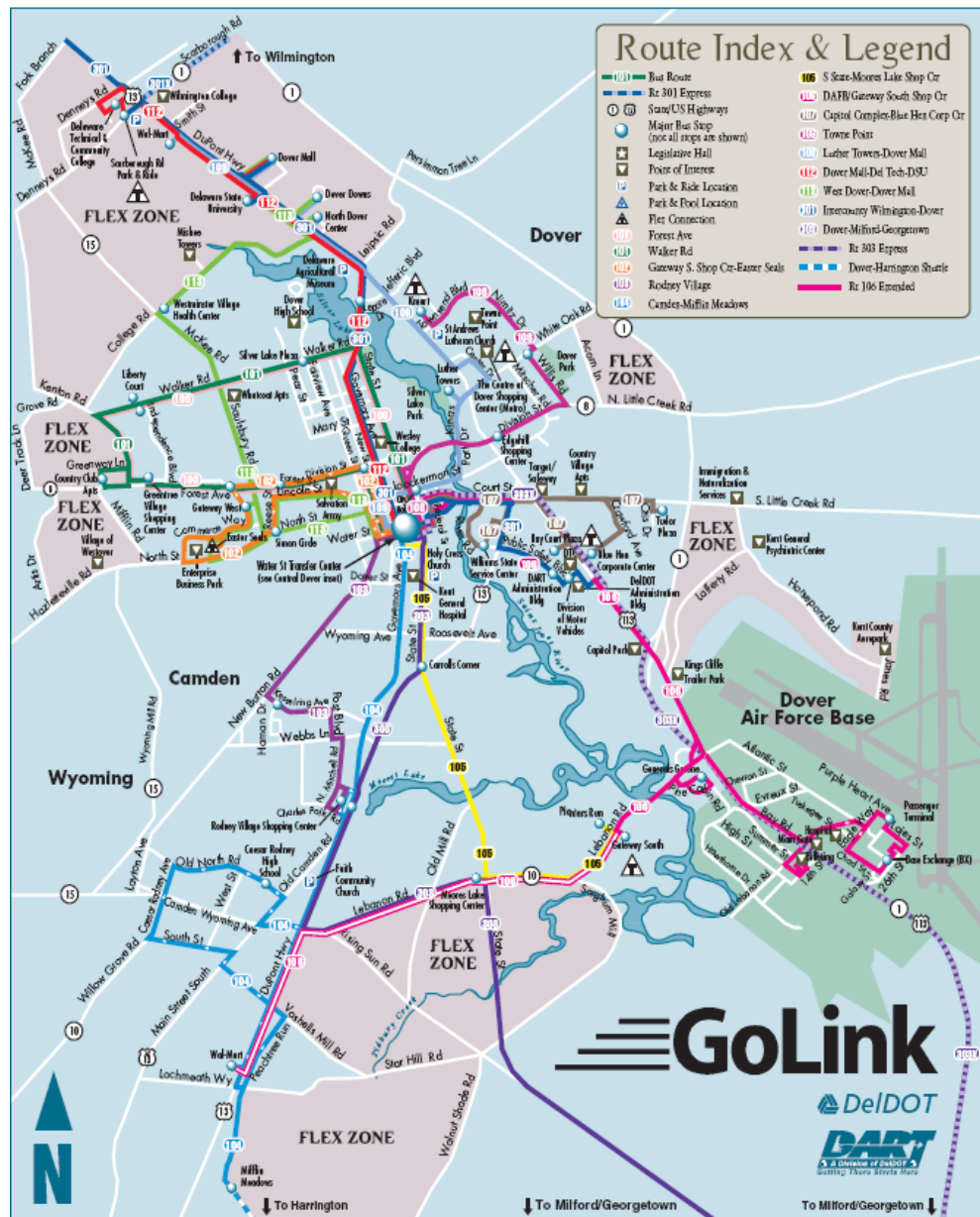
DTC continues to make progress toward making all bus stops compliant with Americans with Disabilities Act (ADA) regulations. Facilities are provided at stops generally based on ridership at that particular location. The most heavily-used bus stops are afforded a bench and shelter or other protection from the elements. As more funding becomes available, provision for ADA accessibility and stop amenities will progress in priority order based on need and ridership levels.

Exhibit 3.19: DART First State Transit Routes



Source: DTC

Exhibit 3.20: DART's Dover Transit Routes



3.2.2 Paratransit Services

The ADA of 1990 requires transit agencies to provide paratransit services for eligible riders within 3/4-mile of the alignment of fixed-route services. DART First State provides statewide door-to-door bus service for individuals who are unable to use fixed-route bus service due to age or disability. Paratransit and special transit demand-response services are available in other parts of Kent County for elderly and disabled residents.

3.2.2.1 Senior Citizens Affordable Taxi (SCAT)

The SCAT program provides a 50 percent discount on taxi fares for senior citizens, and persons with disabilities which prevent them from operating a motor vehicle. There are five privately-owned cab companies throughout the state that provide the taxi service, and are reimbursed by the state. In Kent County, City Cab of Dover and Watkins Cab of Milford provide these services.

Adopted January 28, 2009

3.2.2.2 Federal Section 5310 Pledge Program

This Federal Transit Authority (FTA) and state jointly-funded program is administered by the state. The program provides capital funding to private and public social service agencies for the purchase of vehicles to provide transportation to the elderly and disabled. The vehicles are used by private, non-profit organizations such as senior centers, community centers, churches, nursing homes, and other social service agencies and community-based organizations to provide transportation to their clients for shopping, medical appointments, and recreation. Volunteer drivers, as well as agency-paid drivers, help operate the service. In 2006, the FTA Section 5310 program provided 346,185 trips for the residents of Delaware.

3.2.2.3 Kent-Sussex Reimbursable Program

Through the Kent-Sussex Reimbursable Program, the state provides operating funds and paratransit fare subsidies for elderly and disabled residents in Kent and Sussex counties. The funds are administered through local governments and social service agencies. Services are provided on demand with prior arrangement. Vehicles are equipped with wheelchair lifts.

Exhibit 3.21: Kent County Paratransit Operating Statistics (2003-2007)

Measure	2003		2004		2005		2006		2007	
	Kent	Statewide	Kent	Statewide	Kent	Statewide	Kent	Statewide	Kent	Statewide
Fleet	45	192	49	193	52	201	47	202	48	225
Miles	1.2	6.18	1.44	7.14	1.5	7.8	1.6	8.2	1.6	8.6
Hours	69,522	329,337	78,621	369,701	89,284	439,265	92,621	464,598	93,877	469,476
Passenger Trips	130,214	568,890	150,243	648,698	157,346	711,692	169,171	791,755	176,716	811,907
Trips/Mile	0.11	0.09	0.1	0.09	0.1	0.09	0.1	0.09	0.11	0.09
Trips/Hour	1.87	1.73	1.91	1.75	1.76	1.62	1.83	1.70	1.88	1.73

Source: Delaware Transit Corporation

3.2.3 Intercity and Intercounty Bus Service

The DART First State intercity transit operation provides service with stops in Smyrna, Dover, Magnolia, Milford, and Harrington. Kent County bus service includes connections with Intercounty Routes 301 and 303. Route 301 operates between Dover and Wilmington. Route 303 operates between Dover and Milford.

According to the *Kent County Coordinated Transit/Transportation Plan*, DTC operates a highly successful intercounty route from Wilmington to Dover via SR 1. The overall goal of the route is to reduce the one-way travel time to make it comparable to the single-occupant vehicle. Route 301 operates ten local round trips and six one-way express trips, during weekdays between 4:38 a.m. and 8:48 p.m.

Exhibit 3.22: Kent County Intercity Operating Statistics (2003 – 2007)

Measure	2003	2004	2005 ⁵	2006	2007
Miles	460,317	427,331	386,082	218,548	217,690
Hours	13,867	14,606	14,336	9,868	9,828
Passenger Trips	111,858	115,130	82,778	36,846	36,404
Trips/Mile	0.24	0.27	0.21	0.17	0.17
Trips/Hour	8.07	7.88	5.77	3.73	3.70

⁵ In 2005, DTC began operating Route 301 and 305 and the statistics from that point were captured under New Castle Operating Statistics.

3.2.4 Get-a-Job Get-a-Ride Program

The Get-a-Job Get-a-Ride Program is a DART program for any qualified individual, employed in the State of Delaware, to obtain a free three-week bus pass that will provide them with transportation on any of DART's fixed-route bus routes and paratransit, for their first three weeks of work.

3.2.5 Other Value-Added Services

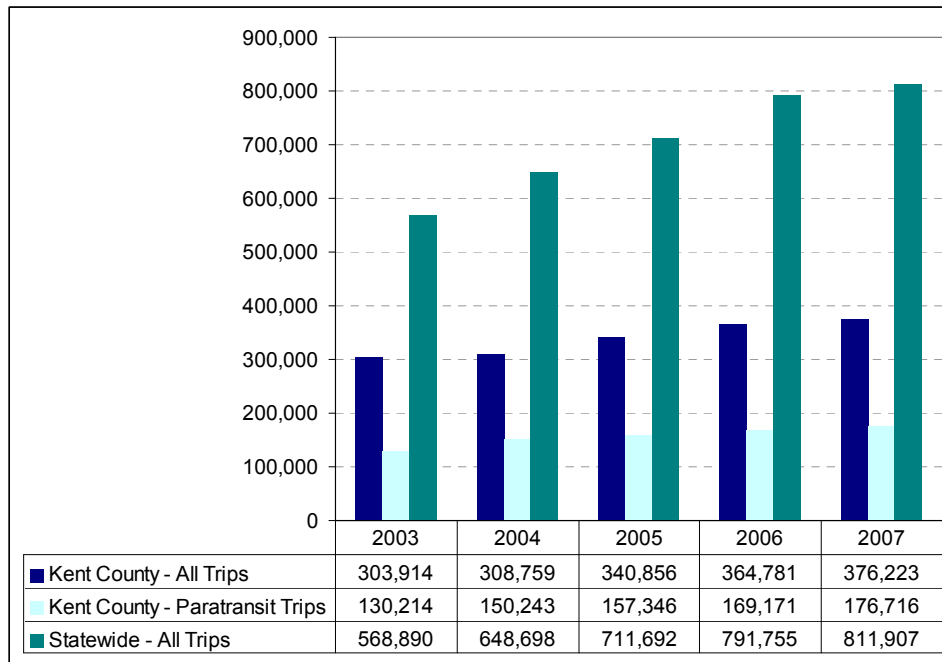
As identified in *Transitioning to Transit, Delaware's Long-Range Transit Plan for the 21st Century: Long-Range Plan 2000-2025*, these additional services are provided by DTC:

- *Travel Training* – Teaches people how to use transit services.
- *Register for Your Future* – Provides free bus service to students registered in adult education classes.
- *Business Partners in Transit* – Educates employers about transit programs and tax credits.
- *Community Partners in Transit* – Works with education, community, and youth groups to encourage transit use and ride-matching service.
- *Mobility Brokerage* – Finds alternative transportation solutions when regular fixed-route services can not meet customers' needs.
- *TransitChek* – Helps employers subsidize employees' transit use.
- *Job Works!* – Provides clients of job placement agencies with free bus transportation to job interviews.

3.2.6 Public Transportation Ridership

Kent County has experienced an increase in its transit ridership in recent years. All passenger trips have increased from 303,914 in 2003 to 376,223 trips in 2007, representing a 24 percent increase in ridership. At the same time, statewide, ridership increased from 568,890 in 2003 to 811,907 riders in 2007, representing an even greater increase of 43 percent. Kent County also experienced an increase in paratransit ridership. In 2003, there were 130,214 paratransit trips while that number grew to 176,716 in 2007, representing a 36 percent increase.

Exhibit 3.23: Kent County and Statewide Passenger Trips (2003-2007)



Source: Delaware Transit Corporation

3.3 Ridesharing

Programs of DART First State include Park-and-Ride/Pool locations, carpooling and vanpooling, school pool, the Home Free Guarantee program, the rewards discount car program, and transit programs.

3.3.1 RideShare Delaware

Ridesharing refers to modes of travel that are alternatives to single-occupant vehicle travel, including carpooling, vanpooling, and taking the bus or train. In 2006, approximately 9.4 percent of Delaware commuters shared a ride to work. Each benefited by saving money in fuel and vehicle maintenance costs, and reducing air pollution and traffic congestion. This compares to the national average of 10.7 percent of commuters.

DART's RideShare Delaware is dedicated to aiding commuters with finding and using alternative modes of transportation. RideShare Delaware is a free public service of DART First State. Funded with a combination of federal Congestion, Mitigation & Air Quality (CMAQ) and state dollars, the goal of the program is to reduce the number of single-occupant vehicles (SOVs) traveling on Delaware's roadways, thus improving our air quality. RideShare works in partnership with local and regional agencies toward meeting federal air quality standards. DART's RideShare Delaware offers free ridematching services for commuters working in the state and for parents of Delaware school students. It includes an emergency-ride-home benefit for registered commuters actively ridesharing to work, vanpool services, and transportation benefit assistance to employers in Delaware. Currently, approximately 459 residents in Kent County are involved in RideShare Delaware, about 12 percent of the total program participants statewide. This includes 314 employees working at 135 Kent County worksites. The largest employer in Kent County offering ridesharing benefits is the State of Delaware.

3.3.2 Park-and-Ride/Pool Lots

An effective Ridesharing program offers alternative methods to accommodate commuters sharing transportation. To do so, DelDOT offers locations to meet.

Park-and-Ride lots in Kent County are located at (see **Exhibit 3.24** and **Exhibit 3.25**):

- Smyrna Rest Stop,
- Delaware Agricultural Museum,
- Water Street Transfer Center,
- Faith Community Church, and
- Scarborough Road Park-and-Ride,
- St. Andrew's Lutheran Church,
- Holy Cross Church,
- Milford Bowling Lanes.

Park-and-Pool lots are located at:

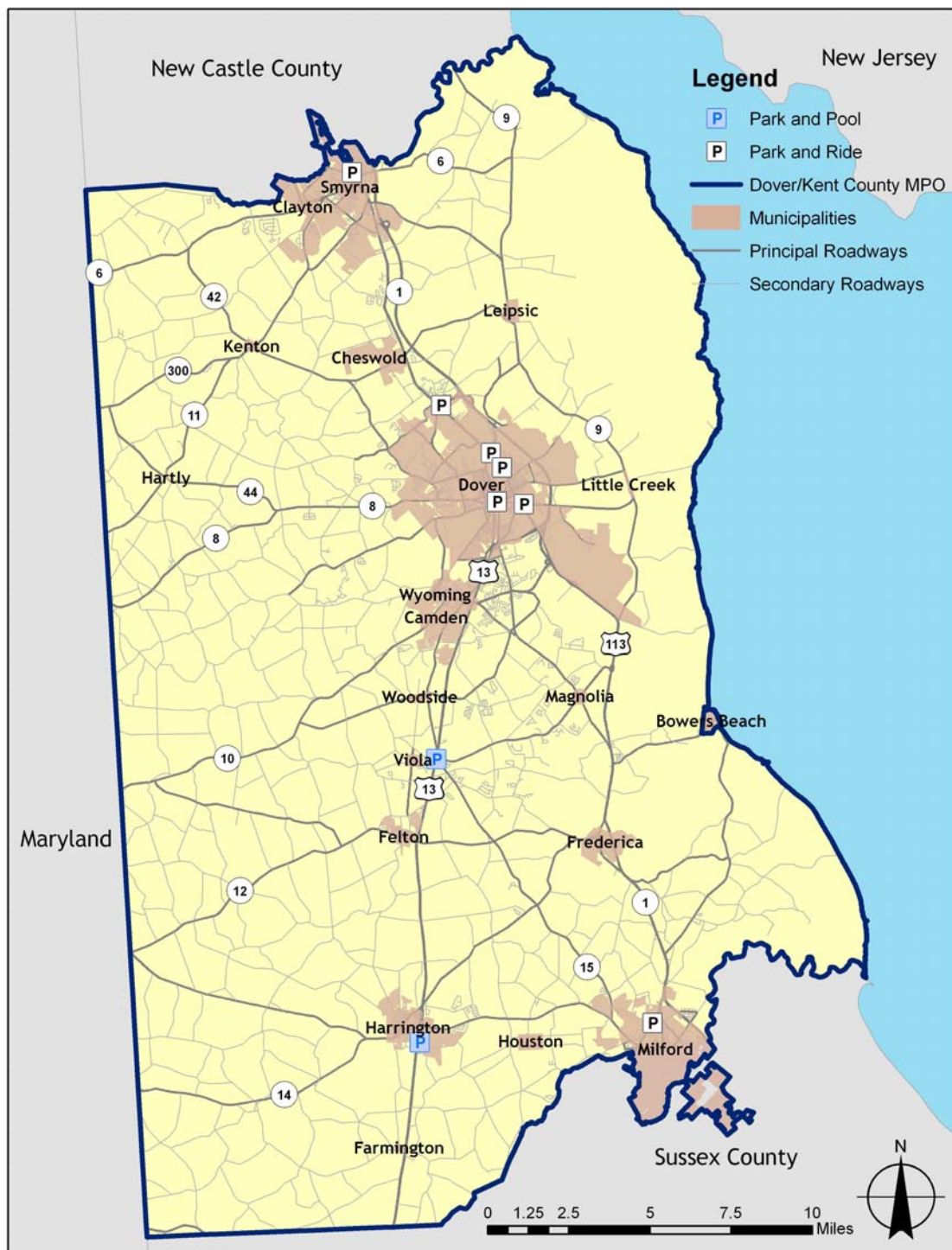
- Shore Stop and
- Harrington Moose Lodge.

Exhibit 3.24: Kent County Park-and-Ride and Park-and-Pool Facilities (2000)

Location	Address	Parking Spaces	Bus Routes	Daily Use	Usage Rate (1998)	Usage Rate (2000)	Change in Usage
Park-and-Ride							
Delaware Agricultural Museum	DuPont Highway, Dover	40	109, 112	10	11%	20%	82%
St. Andrew's Lutheran Church	DuPont Highway, Dover	15	108, 109	5	4%	33%	725%
Holy Cross Church	South State Street, Dover	25	105, 303	5	8%	20%	150%
Faith Community Church	DuPont Highway, Dover	15	104, 303	0	27%	Unknown	N/A
Scarborough Road Park-and-Ride	DuPont Highway, Dover	100	112, 301, 305	19	33%	19%	-42%
Milford Bowling Lanes	DuPont Highway, US 113	20	303	3	N/A	15%	N/A
Smyrna Rest Stop	Between US 13 & DE 1, Smyrna	75	301, 305	23	N/A	31%	N/A
Water Street Transfer Center	Dover	75	101-109, 112, 113, 301, 303	23	N/A	31%	N/A
Park-and-Pool							
Shore Stop	DuPont Highway, Canterbury	15		2	25%	13%	-48%
Harrington Moose Lodge	US 13 Harrington	15		0	11%	Unknown	N/A
MPO Total		395	67		N/A	21%	N/A

Source: DelDOT

Exhibit 3.25: Map of Kent County Park-and-Ride and Park-and-Pool Facilities



Park-and-Pool lots provide convenient parking and a place where commuters can meet carpools or vanpools. From Park-and-Ride lots, commuters can use a variety of modes of transportation such as buses or shuttles. Kent County has facilities and services that promote ridesharing (carpooling and vanpooling). Lot utilization in Kent County is the second highest in the state (26 percent), followed by Sussex County. Kent County has 11 designated public park-and-ride locations, with an average usage of 10 vehicles per weekday,

as listed in Exhibit 3.24. Nine of the lots are official while the rest are considered unofficial. The majority of the lots are within a few miles of downtown Dover, which is located centrally in Kent County. Also, the Statewide Employees Vanpool Program operates in the county. In 1995, fourteen state employee vanpools were operating in Kent County. Fleet Links, which took over the operation of vanpools from DTC, has increased the number to 30 as of 2000. The 50 percent increase in a five-year span demonstrates the commitment of employees to vanpooling.

3.4 Bicycle and Pedestrian Facilities

Delaware law allows bicycling and pedestrian access on all roadways, except for limited-access expressways (functional classifications of Interstate and SR 1 north of the toll in south Dover) or in exceptional circumstances where specifically prohibited. Some roadways have specific design components intended to provide for bicycle travel, such as bike lanes or wide curb lanes/shoulders, whereas on other roadways, bicyclists must ride in the travel lane. Similarly, sidewalks are common pedestrian facilities within urbanized areas, but less common in outlying rural areas. Pedestrians must walk on sidewalks, or if not available, facing traffic as far off to the side of the roadway as possible. Pedestrians also should cross roadways at designated crossings or intersections where provided.

As stated in the Dover Comprehensive Plan Update *From the People-For the People*(2003, amended 2005), and reiterated in the 2008 Comprehensive Plan, bikeways and pedestrian ways along collector and arterial streets are fragmented. There are some “Share the Road” signs posted to increase motorists’ awareness of the presence of bicyclists and pedestrians. The City of Dover still lacks a completely interconnected transportation system; however, the city now requires that sidewalks be constructed and DelDOT typically requires bike lanes as part of any new development or redevelopment application.

3.4.1 Overview of Types of Facilities

AASHTO has developed a classification system for bicycle facilities. This system designates four classes of bicycle facilities: Shared Roadways (no Bikeway Designation), Signed Shared Roadways, Bike Lanes, and Shared Use Paths.

Shared Roadways (no Bikeway Designation) refers to roadways that are not specifically designated as bicycle routes. Bicycle travel is legal and allowed on these roadways (except where specifically prohibited, such as on limited-access expressways as described above), but they lack signs, striping, or other designations that identify them for use by bicycles. Most roads in Kent County fall under the Shared Roadways (no Bikeway Designation) category.

Signed Shared Roadways have been specifically identified as preferred routes for bicyclists, with “Bike Route” signs. These roadways do not provide specific travel lanes for bicycles, but may include paved shoulders, wide curb lanes, or other features that make the route better-suited to bicycle travel.

Bike Lanes are on-street travel lanes reserved for use exclusively by bicycles. They are designated by lane markings and signs, and are typically provided on corridors where higher levels of bicycle use are anticipated, and where separation of motorists and bicycles is beneficial.

Shared Use Paths are off-street trails that serve both bicycles and pedestrians. These paths often serve both recreational and transportation purposes. Such paths are currently only provided in state and local parks in the county.

Sidewalks are generally intended for use by pedestrians only, though bicycles are also allowed to use sidewalks in most areas, provided that they travel at a safe (slow) rate of speed and grant right-of-way to pedestrians. Sidewalks are more commonly provided in towns and urbanized areas, and rarely along more rural roadways. Pedestrians may when sidewalks are not present, use roadway shoulders.

3.4.1.1 Existing Bikeways

DelDOT has identified a number of statewide and regional bikeways in Kent County. The *Delaware Bicycle Facilities Master Plan (2005)* identified 80 miles of Statewide Bicycle Routes, 114 miles of Regional Bicycle Routes, and 307 miles of Recreational Connectors in Kent County (see **Exhibit 3.26**). These bikeways (see **Exhibit 3.27**) are predominantly located on paved shoulder roadways, though many do not have “Bike Route” signs and therefore are not Signed Shared Roadways. Some of these corridors do have “Share the Road” signs intended to increase motorist awareness of bicyclists along the route.

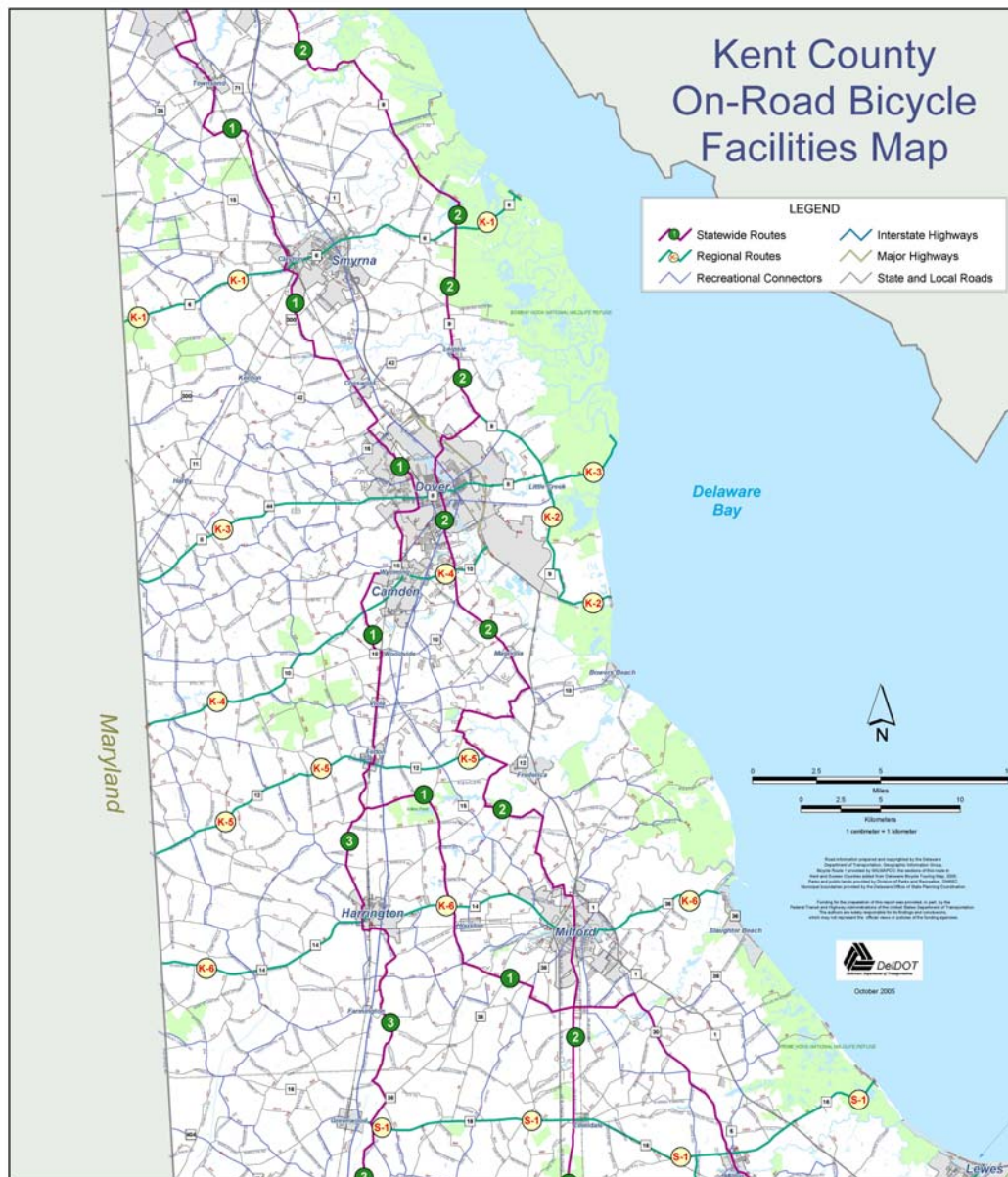
While there are no major physical barriers to bicycling in Kent County, traffic conditions in heavily-traveled areas such as US 13 and US 113 may create local safety concerns to less-experienced bicyclists.

Exhibit 3.26: Designated Statewide and Regional Bicycle Routes in Kent County

Bicycle Routes			Roadways Followed	Length (miles)	Municipalities and Activity Centers Served
Statewide Bicycle Routes	1	Bicycle Route 1	-	38	Clayton, Cheswold, Dover, Wyoming, Felton, Houston
	2	Wilmington-Selbyville	-	42	Leipsic, Dover, Magnolia, Frederica, Milford, Cedar Swamp Wildlife Area
Regional Bicycle Routes	3	Delmar to Felton	-	12	Harrington, Farmington
	K-1	MD Border To Woodland Beach	SR 6 to Woodland Beach	18	Clayton, Smyrna, Woodland Beach Wildlife Area
	K-2	NE Dover To Kitts Hummock/Delaware Bay	SR 9/CR 337 to US 1	11	Little Creek, Little Creek Wildlife Area, Dover Air Force Base, John Dickenson Plantation, Kitts Hummock
	K-3	MD Border To Port Mahon	SR 8, SR 9, to Port Mahon Road	24	Dover, Little Creek, Port Mahon
	K-4	MD Border To Dover Air Force Base	SR 10 to US 113	16	Wyoming, Camden, Dover Air Force Base
	K-5	MD Border To W. Frederica	SR 12 to SR 12/CR 380	14	Felton, Frederica
	K-6	MD Border to Slaughter Beach	SR 14 at MD Border to SR 36 in Sussex County	19	Harrington, Houston, Milford, Slaughter Beach, Milford Neck Wildlife Area

Source: Delaware Bicycle Facilities Master Plan, 2005

Exhibit 3.27: Kent County Bicycle Facilities Map



Source: DelDOT

3.4.1.2 Existing Pedestrian Facilities

Sidewalks are the primary type of pedestrian facility in the region, although pedestrians may use bike paths, bike trails, greenways, and paved shoulders (walking facing traffic) when no sidewalk is present. According to 2004 DelDOT Pedestrian Facility data, there are 25.3 miles of footpaths, over 400 miles of sidewalk,⁶ and nearly seven miles of crosswalks in Kent County.

Bicyclists are legally permitted on sidewalks unless specifically prohibited such as in certain downtowns or other locations where potential conflicts with pedestrians are high. However,

⁶ While sidewalks are paved, non-permeable surfaces, footpaths are not.

sidewalks are not intended to accommodate most bicyclists, who can reach speeds of 15-20 miles per hour. Pedestrians travel at about three miles per hour.

As previously stated, sidewalks are less common in outlying unincorporated areas. DelDOT maintains an inventory of roadways with sidewalks in municipalities and in suburban developments. Statewide, Delaware has 784.19 miles of roadway with sidewalks on both sides, and 206.4 miles of roadways with sidewalks on one side.

Exhibit 3.28 lists miles of roadways with sidewalks in Kent County. There are slight increases since 1994 in Kent County—approximately one mile more of one-sided sidewalks and three miles more of double-sided sidewalks. Kent County accounts for 10.9 percent of the statewide total for miles of roadways with sidewalks on both sides, and 14.8 percent of the total for miles of roadways on one side only.

Exhibit 3.28: Roadways with Sidewalks, Kent County, 2000

	Roadways in Miles – 1994		Roadways in Miles – 2000	
	One-sided Sidewalk	Double-sided Sidewalk	One-sided Sidewalk	Double-sided Sidewalk
Kent County	29.55	82.45	30.57	85.26
Statewide	NA	NA	206.4	784.19

Source: DelDOT

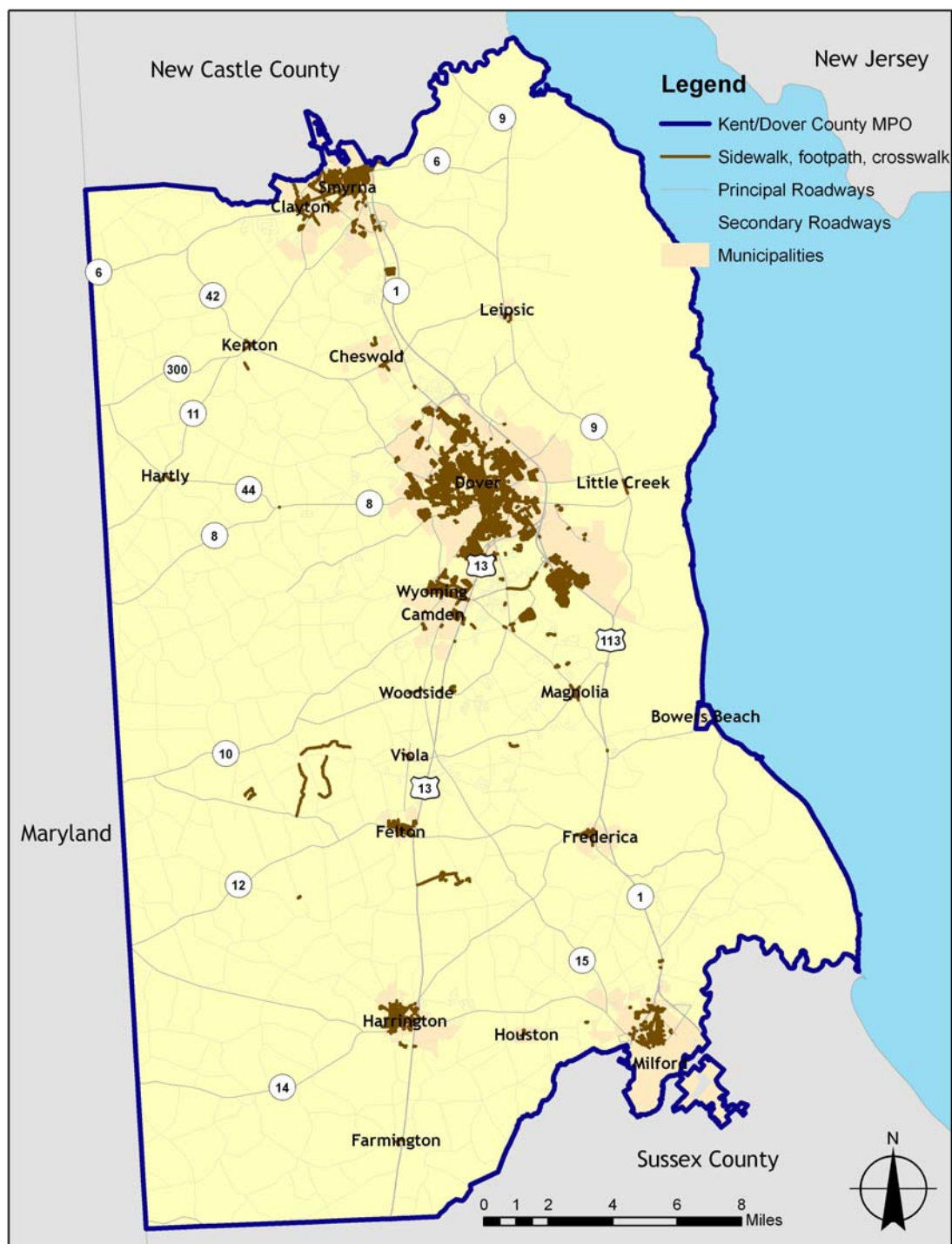
According to 2004 DelDOT Pedestrian Facility data as presented in **Exhibit 3.29**, within Kent County there are 25.3 miles of footpaths, over 400 miles of sidewalk, and nearly 7 miles of crosswalks. **Exhibit 3.30** shows the areas where sidewalks, footpaths and/or crosswalks are present in the county.

Exhibit 3.29: Type of Pedestrian Facility

Type of Facility	Distance (Miles)	Percent of Total
Crosswalk	6.7	1.5%
Footpath	25.3	5.7%
Sidewalk	409.8	92.8%
Total	441.8	100.0%

Source: 2004 DelDOT Statewide Sidewalk Database

Exhibit 3.30: Sidewalks, Footpaths, and Crosswalks in Kent County



3.4.2 Bicycle and Pedestrian Planning

DelDOT is actively updating the state's long-range bicycle plan that will address the bicycle facilities at both the route and policy levels. The Pedestrian Action Plan and Bicycle Facilities Plan will guide efforts to improve bicycle and pedestrian opportunities in Delaware and its counties.

The City of Dover requires new sidewalk and bicycle facilities for all development projects. The *US 13 Pedestrian Improvements* project proposed pedestrian improvements to provide a safer travel environment for pedestrian and transit customers. Improvements were needed due to lack of sidewalks, crosswalks, pedestrian mobility restrictions due to lack of curb cuts, and lack of protection or pedestrian signals to assist them.

3.4.2.1 DelDOT Pedestrian Action Plan

DelDOT is in the process of developing its statewide pedestrian action plan. This plan will address and propose solutions to identified key issues in an effort to make walking a safe, convenient, efficient and comfortable means of transportation. Currently no such plan exists and there is a recognized need to lay the groundwork for the provision of pedestrian infrastructure along state-maintained roadways.

3.4.2.2 DelDOT Bicycle Facilities Plan

The *Delaware Bicycle Facility Master Plan (2005)* was developed in order to define and implement a statewide system of designated, on-road bicycle routes. The Bicycle Facility Master Plan will be considered in conjunction with several other policies and programs including the DelDOT Rails-to-Trails Program, and local and regional bicycle master plans. The Plan recommends 92 miles of Statewide Bicycle Routes, 102 miles of Regional Bicycle Routes, and 307 miles of Recreational Connectors in Kent County.

The overall purpose of the plan is to recognize bicycling as an integral part of the transportation system and provide for suitable accommodations for bicycles on the statewide roadway network. Implementation of the plan will achieve the following goals:

- Integrate existing bicycle routes and trails to a larger, statewide bicycle network.
- Establish bicycle routes between municipalities, activity centers, and recreational areas throughout the state.
- Tie bicycles to other modes, creating availability for mode share and reducing the need for single-occupant vehicles, particularly for work trips.

3.4.3 Design of Facilities

The careful design of crosswalks, traffic signals, medians, overpasses, underpasses, bicycle parking, and pedestrian plazas further supports bicycling and walking. These facilities may be particularly critical for children, senior citizens, and disabled pedestrians. Related facilities such as bicycle parking are also necessary at commercial destinations, employment sites, and public transit connections. DelDOT has installed high-security clamp-type bike racks at many park-and-ride lots across the state, and employers are encouraged to do the same.

The most significant pedestrian improvement project underway is to provide sidewalk connections throughout the US 13 corridor in Dover.

3.4.3.1 “Complete streets”

Complete streets are designed and operated to enable safe and efficient access for all users. DelDOT, Kent County and Dover have adopted measures to improve bicycle and pedestrian facilities as a standard course of business. Most new roadway projects consider the need of, and include improvements for, multi-modal facilities. In addition, through the

land development process, more stringent requirements have been imposed on developers to include sidewalks and/or shared use paths in conjunction with their projects. Also, various types of traffic calming devices may facilitate pedestrian travel by slowing motor vehicle travel, increasing visibility, and providing pedestrian crossing refuge islands. Two suburban developments in Kent County have utilized traffic calming features, primarily speed humps, on their streets. Downtown Dover uses sidewalk bulb-outs, textured pavements, on-street parking, and a traffic-diverter to calm traffic and create a more pedestrian-friendly environment.

Roadway projects with planned bicycle facilities will be based on the new bicycle facility design guidelines established in both the Facility Plan and the Road Design Manual.

3.4.4 Safety

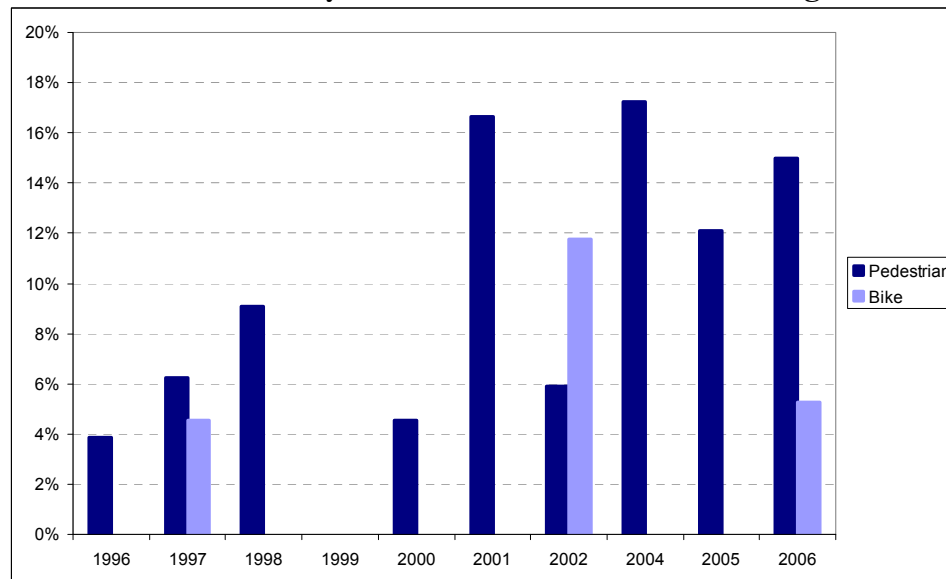
Bicyclists and pedestrians are at risk of injury from motor vehicles and other hazards along roadways and pathways. Over the past 15 years, generally more crashes have involved pedestrians than bicycles, as seen in **Exhibit 3.31**. Overall, pedestrian crashes increased between 2000 and 2006, with a low in 2002. Bicycle crashes have remained similar in the same time period. In 2006, bicycle and pedestrian crashes accounted for 2.2 percent of all traffic crashes. Since 2000, bicycle and pedestrian crashes have made up between 1.5 and 2.2 percent of all traffic crashes in Kent County. It is important to note that impaired pedestrians were involved in 30 to 40 percent of these crashes.

Exhibit 3.31: Kent County Pedestrian and Bicycle Traffic Crash Data

Year	TOTAL CRASHES		INJURY CRASHES		FATAL CRASHES	
	Pedestrian	Bike	Pedestrian	Bike	Pedestrian	Bike
1990	32	26	30	25	2	1
1991	33	21	30	20	3	0
1992	39	17	32	17	7	0
1993	20	20	19	20	1	0
1994	26	21	25	19	1	0
1995	22	28	19	27	1	0
1996	26	27	25	27	1	0
1997	32	22	30	21	2	1
1998	22	19	20	19	2	0
1999	21	20	20	17	0	0
2000	22	16	22	14	1	0
2001	24	22	20	22	4	0
2002	17	17	17	14	1	2
2004	29	15	24	15	5	0
2005	33	19	29	19	4	0
2006	40	19	34	18	6	1

Source: DelDOT

Exhibit 3.32: Kent County Percent of Total Crashes Resulting in Fatalities



Source: DelDOT

3.5 Passenger and Freight Railroads

The state as a whole has five freight railroads and 218 freight rail-miles. Kent County is served by only one railroad, the Class I carrier Norfolk Southern (NS), which enters the county near Clayton and exits south of Harrington. To the north, NS connects to the national railroad system via the Amtrak Northeast Corridor.

There are several major commodities carried by rail in Delaware, according to waybill samples provided by the railroads: automobiles, coal, stone/aggregates, chemicals, and grain. Coal and grain are the two major commodities delivered to Kent County. Grain imports are necessary to support the massive poultry industry, which has outstripped the ability of the local growers to supply the entire amount. Coal is also crucial for electric power production. Other commodities being delivered in Kent County are food products and chemicals. Rail freight represents an under-utilized resource in Delaware, with the volume of service consistently below the capacity of the rail lines and below the potential to warrant improvements in most locations. There are some important areas where chokepoints exist, and addressing these will increase velocity on the entire downstate network.

DelDOT continues to promote freight rail as an alternative to truck traffic on Delaware's highways. DelDOT works with freight railroads throughout the state to improve infrastructure and service, and to address citizen concerns about safety, noise, traffic, and other rail-related issues. DelDOT has partnered with NS on major infrastructure projects in the past, and continues to seek opportunities for public-private partnerships in the sector.

3.5.1 Freight Rail Lines

Rail lines offer important economic benefit for industrial development. Future Land Use Plans in the Dover and Kent County Comprehensive Plans designate areas along rail lines for industrial uses. Kent County has 56 miles of active freight railroad lines, which are operated by Norfolk Southern. The Delmarva Secondary and Indian River Secondary Tracks, which traverse Kent, are rated as Federal Railroad Administration (FRA) Class 3 and

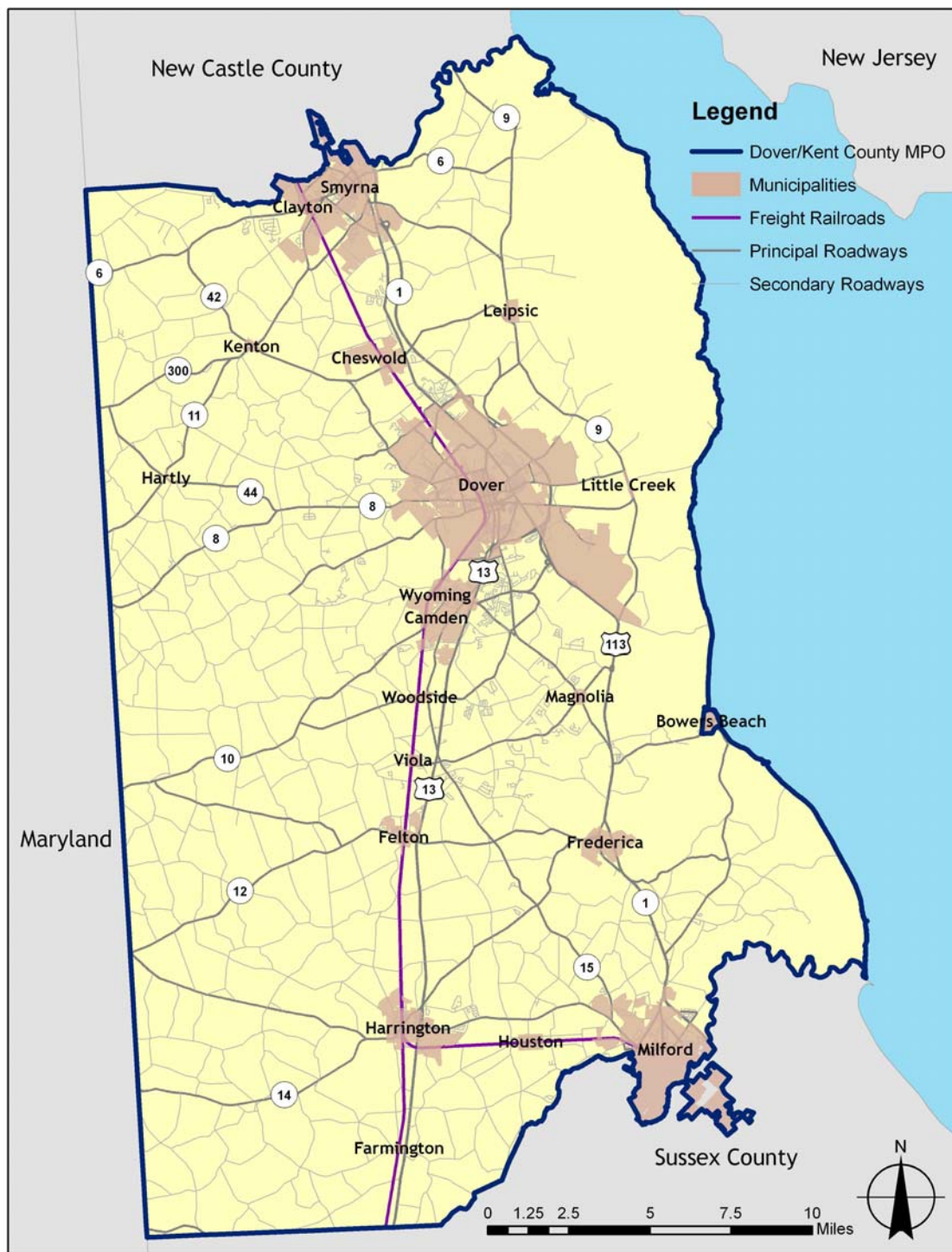
Adopted January 28, 2009

have a maximum speed limit of 40 mph. The Indian River Secondary Track splits from the Delmarva track at the Harrington Yard. **Exhibit 3.33** illustrates the following rail lines:

- *Delmarva Secondary Line* – This primary north-south connection along Delmarva is operated by Norfolk Southern and roughly parallels the US 13 roadway corridor. This line continues south into Maryland, making a connection to the Bay Coast Railroad in Pocomoke, Maryland, and continuing to a barge that floats rail cars across the Chesapeake Bay at Cape Charles, Virginia (allowing for a redundant, but very low volume, rail connection onto the Delmarva Peninsula). To the north, this line connects to the Northeast Corridor at Newark, serving many destinations in the northeastern United States. This is the longest rail line in Kent County, spanning 34.5 miles within the county.
- *Indian River Secondary Line* – Another Norfolk Southern line in Kent County, this runs due east through Houston to Milford, after splitting from the Delmarva Secondary at Harrington Yard, and continues in a southerly direction on the east side of US 113 in Delaware into Maryland, covering 7.8 miles in Kent County.

Primary commodities on these lines include coal, chemicals, agricultural products, forest products, and construction aggregates.

Exhibit 3.33: Freight Rail Lines



The establishment of a new Norfolk Southern Delmarva Business Unit (DBU), to promote rail service in the area, is a good indicator for the future of rail freight in the region. With operations that began in 2006, through enhanced marketing and operations, the DBU is intended to strengthen rail service in New Castle County and the Delmarva Peninsula, by better connecting the railroad to its customers, improving the use of rail assets, and creating opportunities for new businesses to locate in Kent and Sussex Counties.

Adopted January 28, 2009

3.5.2 Freight Rail Yards and Transfer Facilities

Additional intermodal transfer centers, switching yards, and similar facilities greatly increase the ability of rail transport to capture additional traffic, which might otherwise travel its entire journey by truck. Kent County has two such facilities in operation.

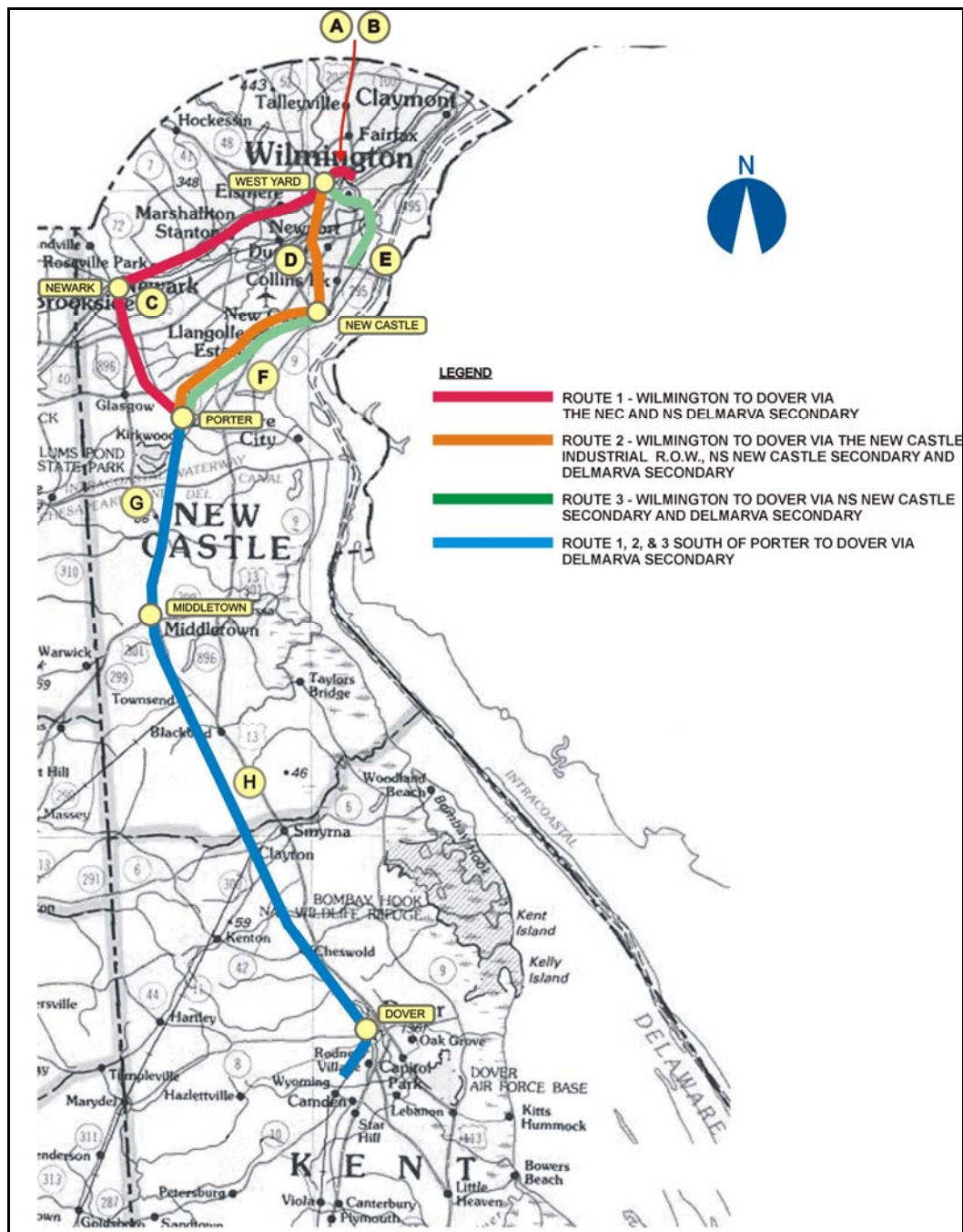
- *Corrado America (not currently in operation)* – A rail-to-truck bulk commodity transfer facility, owned by Corrado America, exists in Felton for the transfer of aggregates.
- *Jello Yard* – This yard services the General Foods and Proctor & Gamble plants on the west side of Dover. Here, many cars of raw materials arrive from various points in North America, for the manufacture of paper and food products. This location, located on New Burton Road, is not fenced and is adjacent to an increasingly busy New Burton Road and residential neighborhoods. This remains a concern among some local residents and lawmakers.
- *Harrington Yard* – Harrington Yard is a location where train crews report to duty. Here, scheduled freights begin and end their journeys for destinations throughout the United States. Also, local trains from the Indian River Secondary Line and destinations on the lower Delmarva Peninsula, begin and end their journey at Harrington. The switching movements needed to build and break train consists can cause traffic issues in downtown Harrington by blocking at-grade crossings.

3.5.3 Passenger Rail

There is currently no regularly-scheduled passenger rail service available in Kent County. The nearest passenger stations are Newark, Churchmans Crossing, and Wilmington in New Castle County. Amtrak, DTC, and NS, partner each year to provide a one-day excursion train from Philadelphia to the Delaware State Fair Grounds, during the State Fair via Newark, Middletown, and Dover. The feasibility of future downstate commuter rail service has been studied between Wilmington and Dover, with the conclusion that the current land use pattern and total population numbers and densities do not support passenger rail.

DTC has conducted three phases of study for commuter rail service to Middletown or Dover, with the most recent study completed in 2004. It was determined that the service could use existing NS freight right-of-way, although significant infrastructure improvements would be required. Similar to existing rail facilities in New Castle County, extensive parking and local transit connections could be provided, allowing the rail service to be the backbone of the statewide transit system. While major planning for this service is on hold, studies on specific issues may be conducted in the future. Infrastructure improvements that would benefit existing freight service, and commuter rail in the future, are under consideration.

Exhibit 3.34: Delaware Passenger Rail Study – Proposed Alternative Routes



3.6 Aviation

Kent County has seven aviation facilities available for public use. The primary aviation facility in Kent County is Dover Air Force Base (DAFB), which permits limited public service at the Civil Air Terminal. Charter aircraft operations are limited, and are authorized on a case-by-case basis. DAFB is the largest military or civilian aerial port facility on the East Coast and is an important part of Kent County's economy. In addition to the facilities

at DAFB, five of Kent County's other public-use aviation facilities provide general aviation services. Another facility, the DelDOT Helistop is a publicly-owned helicopter landing pad, located at the DelDOT complex in Dover, and available for public use. The county continues to pursue opportunities for economic development within these facilities and in the surrounding areas.

3.6.1 Civil Air Terminal (CAT) at Dover Air Force Base

The DFAB has a primary mission to house C-5 and C-17 transport planes, civilian use is secondary. A joint-use agreement between the Air Force and DelDOT authorizes DelDOT to permit scheduled commuter or commercial charters, as well as general aviation aircraft that have been approved in advance by the installation commander.

The ability to land large planes makes this facility unique in Kent County. The CAT is instrumental in facilitating the NASCAR events at Dover Downs. The ability to accommodate the high numbers of operations and large-sized airplanes employed by racing teams, helps Dover remain competitive as a venue. Potential for expansion of service levels and facilities may be constrained by the primacy of the Air Force mission at the base. The CAT was closed for six months following the September 11, 2001 terrorist attacks due to security concerns.

There are currently plans to expand the parking apron adjacent to the CAT to accommodate large civilian cargo planes that serve the airbase. Additional parking pads are sought to accommodate increased numbers of private/chartered passenger flights.

The Kent County AeroPark is a 115-acre county-owned industrial/business park located adjacent to the CAT adjacent to the perimeter of DAFB. The county desires to attract industries such as manufacturing, publishing, and warehousing to take advantage of available land and buildings. Kent County and the Central Delaware Economic Development Council (CEDS) are committed to partnering with Dover Air Force Base and its related businesses, to protect and support its mission.

3.6.2 Delaware Airpark

The Delaware Airpark in Cheswold was purchased by DelDOT in 2000 and is operated by the Delaware River and Bay Authority (DRBA). The airport serves general and corporate aviation in Kent County, as well as the Delaware State University aviation flight training program. Runway expansion at the airport is planned for 2009. DRBA is interested in pursuing additional upgrades to the facility, to provide additional private and corporate airport capacity and enhanced security. DelDOT is committed to protecting the airport by working with the local land use agencies to locate compatible development and discourage incompatible uses.

3.6.3 Other Aviation Facilities

Other public use facilities that provide general aviation services include Smyrna Airport, Chandelle Estates Airport, Jenkins Airport, Chorman Airport, and the DelDOT Helistop. All are privately-owned and operated facilities, except for the DelDOT facility.

Most privately-owned airports support some sort of business—from airplane rides to recreational flying to equipment salvage and repair. One very important activity associated with private airports is aerial application of fertilizers and pesticides, crop dusters. This

activity is crucial for the viability of Delaware's agricultural community. The state contracts for mosquito control spraying, as well.

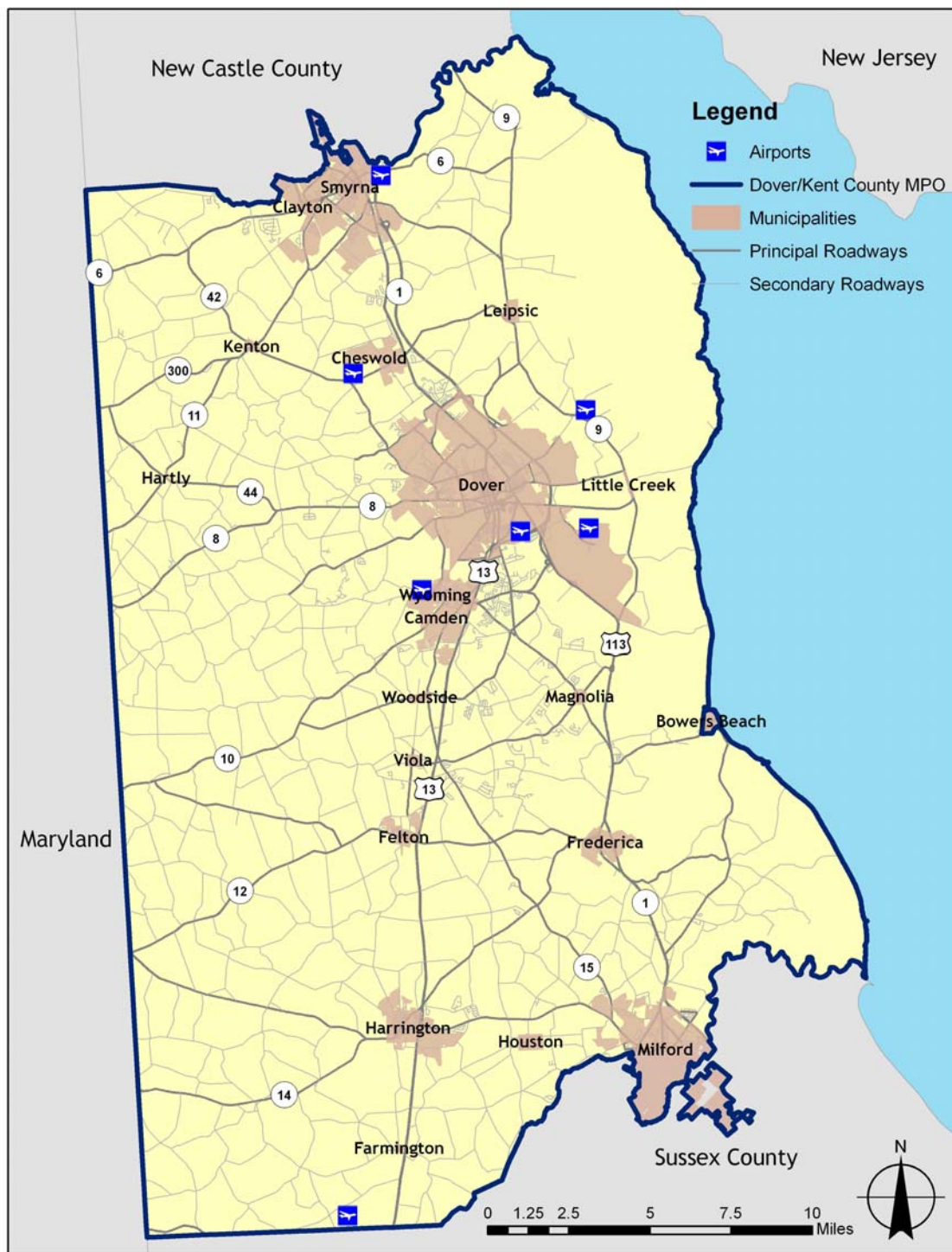
Exhibit 3.35: Summary of Public Use Airports

Name	Location	Longest Runway	Runway Surface	Services	1999 Operations	Projected 2025 Operations*
Smyrna Airport	Smyrna	2,600 ft.	Turf	Hangars, Tiedowns, Avgas	4,500	3,000
Chandelle Estates Airport	Dover	2,550 ft.	Paved	Hangars, Tiedowns, Repairs, Avgas	3,500	8,000
Delaware Airpark	Cheswold	3,582ft.	Paved	Hangars, Tiedowns, Repairs, Avgas, Jet	8,000	46,400
Jenkins Airport	Wyoming	2,875 ft.	Turf	Hangars, Tiedowns, Repairs, Avgas	2,500	3,200
Civil Air Terminal	Dover	13,000 ft.	Paved	Fuel By Request	400	1,400
Chorman Airport	Farmington	3,588 ft.	Asphalt	Tiedowns, Repairs, Avgas	NA	38,400
DelDOT Helistop	Dover	60 x 60 sq. ft.	Asphalt	None	NA	NA

*Note : * From Delaware State Aviation System Plan Update (draft)*

Source: DelDOT Office of Aeronautics

Exhibit 3.36: Airports



The annual number of operations at each public-use facility is well within the facility's capacity for annual service volume. However, most of the privately-owned airfields are anticipated to have inadequate capacity within the next 15 to 20 years. Delaware has many excellent air cargo facilities, including Dover Air Force Base, which could accommodate large cargo planes, but there is not a market for high-value imports/exports at present that

could efficiently utilize that capacity. UPS has a major facility in Philadelphia, and FedEx is in Salisbury, making truck delivery to and from those locations cost-effective.

DelDOT also completed an Air Cargo Study for the Civil Air Terminal in 2006. The study recommends expanding the facility to accommodate commercial (privately-owned) air cargo that serves the military base. This activity could lay the groundwork for additional non-military-oriented commercial aircraft in the future as demand grows in the region, but the major challenge is funding these types of expansions.

Delaware continues to make progress on implementing recommendations from the 1998 Delaware Aviation System Plan. While there is no current progress on attracting commercial aviation service to Kent County, the provision of general aviation services continues to be a high priority issue for the county. An update of the statewide Aviation System Plan will be completed in 2008.

3.7 Marine

Rivers, ports, bays, and estuaries are all used for movement of peoples, goods, and services, and also serve as recreation destinations and uses. Delaware Bay, Leipsic River, St. Jones River, Murderkill River, and other waterways historically provided avenues for commerce and recreation, and can serve the movement of goods in and to Kent County in the future. The one existing waterborne cargo operation is fuel delivery by barge at Port Mahon.

The estuary formed by the Delaware River and Delaware Bay meets the Atlantic Ocean at Cape Henlopen, south of Kent County. Part of the Intercoastal Waterway, which runs along the entire eastern seaboard, this estuary is also a major shipping channel serving the ports of Wilmington and Philadelphia.

Most of the bay coastline in Kent County is tidal marsh, and is home to the Bombay Hook National Wildlife Refuge and other important wildlife areas. Therefore, most of the water access in the county is in small-scale recreational use. The commercial and recreational fishing facilities in Bowers Beach are the most significant docking facilities in the county; however, smaller operations can also be found in Leipsic. The environmental sensitivity of the area's waterways and the protective restrictions of the Delaware Coastal Zone Act are important factors in determining the viability of waterborne commerce for Kent County.

Considered as a whole, the bay/river is the world's largest freshwater port, and the combined activities of the various shippers using it rank the waterway second in the United States in total waterborne commerce. The Delaware River carries approximately 2,700 ships per year to and from several public port facilities and private industry facilities along its banks in northern Delaware, Pennsylvania, and New Jersey.

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4. Trends and Implications on Future Transportation Needs

How effectively transportation systems function affects the quality of the built and natural environments as well as the quality of life of residents and visitors. Transportation needs are determined by comparing the demand for movement of goods and people to the supply of transportation facilities. To understand the future transportation needs of Kent County, it is necessary to understand where people will live and work, the ways in which they will make use of the land, and the travel choices they will make.

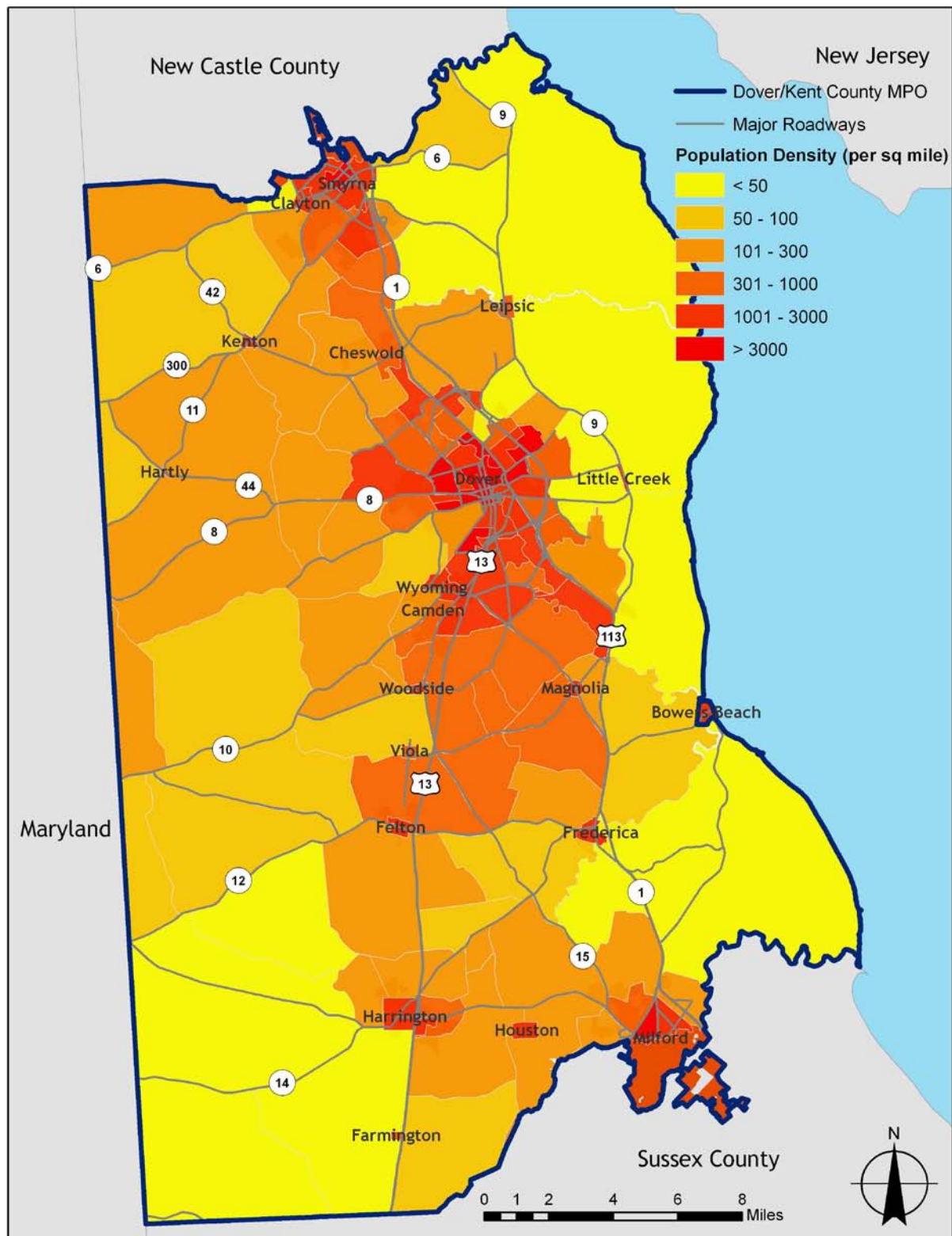
Various trends are examined and modeled to support identification of future transportation needs. This chapter discusses population and employment trends, transportation network use, future land use, and travel trends based on public opinion.

4.1 Population and Employment Trends

Population and employment trends compared with existing conditions indicate future transportation needs. The population and employment trends of the Dover/Kent County Metropolitan Planning Organization (MPO) region indicate potential deficiencies in the system if unfettered growth or even growth at a pace similar to recent periods continues. The MPO reviewed past trends and projected future population growth to predict the future conditions of our road network. As we will describe in subsequent pages, the road network will suffer for the additional vehicles that accompany most growth.

The MPO adopted population projections using data from the Delaware Population Consortium (DPC). The consortium uses data gathered by the U.S. Census Bureau and other federal agencies and projects growth based on national trends, local land use plans, local trends, and local knowledge provided by area planning officials. The DPC collects data at the county level and then it is disaggregated into Census County Divisions (CCD). To use the data in transportation planning, it is distributed among Traffic Analysis Zones (TAZs), which are the base units of DelDOT's travel demand model. **Exhibit 4.1**, below, portrays the current population density in the MPO area by TAZ. **Exhibit 4.2** shows how TAZs were aggregated to approximate CCDs in order to show growth trends in various areas. As shown in **Exhibit 4.3**, the biggest growth is expected to occur in the Smyrna area followed by Kenton and Milford areas.

Exhibit 4.1: 2005 Population Density



Source: DelDOT

Exhibit 4.2: Census County Divisions



Source: DelDOT

Exhibit 4.3: Population Projections by CCD

MPO Area by CCD	1990	2000	2005	2010	2015	2020	2025	2030	Percent Change 2005 - 2030
Central Kent County	13,165	18,083	19,001	20,515	22,030	22,947	24,423	25,899	36%
Dover Area	55,699	66,027	67,788	73,192	78,596	79,148	84,240	89,331	32%
Felton Area	9,153	6,109	6,363	6,870	7,377	7,237	7,703	8,169	28%
Harrington Area	9,729	10,860	11,524	12,443	13,361	14,163	15,074	15,985	39%
Kenton Area	6,075	5,985	6,393	6,903	7,412	8,138	8,662	9,185	44%
Milford Area	8,468	16,816	20,211	21,822	23,433	25,407	27,041	28,675	42%
Smyrna Area	12,234	13,113	15,682	16,932	18,182	25,066	26,679	28,291	80%
Total	114,523	136,993	146,962	158,677	170,391	182,106	193,822	205,535	40%

Source: Delaware Population Consortium, 2007 Projections, DelDOT

Note: Milford and Smyrna populations include the Sussex County and New Castle County portions of the respective municipalities.

4.1.1 Total Population

The DPC released their 2007 edition of population projections in October 2007. Compared to New Castle and Sussex counties, the Kent County population is projected to continue to have the smallest population in the state, as shown in **Exhibit 4.4**. At the same time, Kent County saw the largest percentage of population increase of 18 percent between 2000 and 2007 in the state of Delaware. The populations of Kent and Sussex counties are projected to increase 23.8 percent and 23.4 percent, respectively, between 2000 and 2010 as compared to the state's 13.6 percent projected increase for the same period. This growth puts increased demands on the existing transportation network in Kent County.

Exhibit 4.4: Population Projections

Area	2000	2007	2010	2015	2020	2025	2030
State of Delaware	786,418	863,904	893,184	937,611	977,645	1,012,591	1,042,476
Kent County	127,103	150,516	157,404	166,994	175,717	182,919	189,431
New Castle County	501,856	529,590	541,350	559,497	575,162	588,484	599,805
Sussex County	157,459	183,798	194,430	211,120	226,766	241,188	253,240

Source: Delaware Population Consortium, 2007 Projections

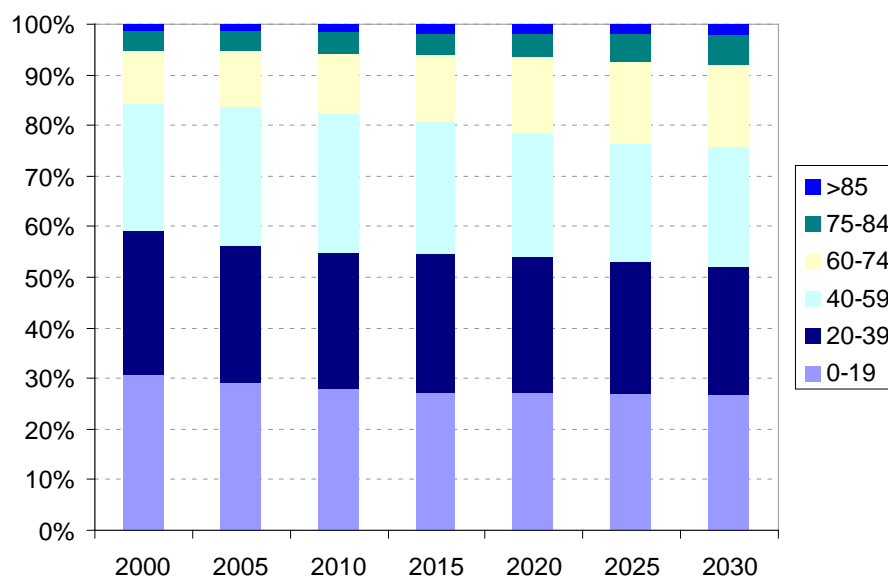
4.1.2 Age

The Dover/Kent County MPO region has an aging population as shown in **Exhibit 4.5**. This population is projected to grow through the year 2030. The 59 years and younger age

groups are predicted to slightly decrease through 2030. New drivers are not expected to increase the demand on the existing transportation system.

The 60 years old and over age groups are projected to increase the most over the next 20 years and represent approximately 25 percent of the overall population. As the aging population continues to grow, the demand for medical transportation and other coordinated human services transportation is also expected to climb. Mobility and access will become increasingly important for this population, and will need to be considered in decision-making for multiple modes, including roadway design standards and public transit.

Exhibit 4.5: Dover/Kent County MPO Population by Age Group as Percentage of Total Population



Source: Delaware Population Consortium, 2007

4.1.3 Households

Population and household size, coupled with levels of automobile ownership, can indicate demand for transportation. As shown in **Exhibit 4.6**, according to the Delaware Population Consortium projections, an average of 2.65 persons resided in each household in 2005. The projected persons per household average is expected to continue to decrease to 2.54 persons by 2030 while the number of households is expected to increase. Thus, the number of persons living in Dover/Kent County MPO households will decrease. Nonetheless, the projected increase in households translates to a greater demand for goods, services, and employment, thereby placing a greater demand on the transportation system. At the same time, smaller household sizes combined with larger numbers of households means more trips per person.

Exhibit 4.6: Dover/Kent County MPO Population and Household Size

Year	Population	Households	Average Persons per Household
1990	114,523	39,627	2.89
2000	127,103	47,250	2.69
2005	146,962	55,457	2.65
2010	158,677	60,564	2.62
2015	170,391	65,788	2.59
2020	182,106	70,858	2.57
2025	193,821	76,008	2.55
2030	205,535	80,919	2.54

Source: Delaware Population Consortium, 2007

4.1.4 Employment

Employment is expected to increase in the county at rates consistent with the population increases. By 2030, employment is expected to reach 82,394, which represents a 10 percent increase over the 2005 employment of 74,663, as shown in **Exhibit 4.7**. The biggest increases are expected to occur in the Milford area. **Exhibit 4.8** shows employment density per square mile in 2030. Government and community services are expected to remain the most important segment of the economy. Dover Air Force Base remains a major engine of economic stability in the area, being directly responsible for 1,040 civilian and 5,300 military jobs and having an economic annual impact of \$460 million (based on 2007 information).¹

Exhibit 4.7: Dover/Kent County MPO Employment Growth

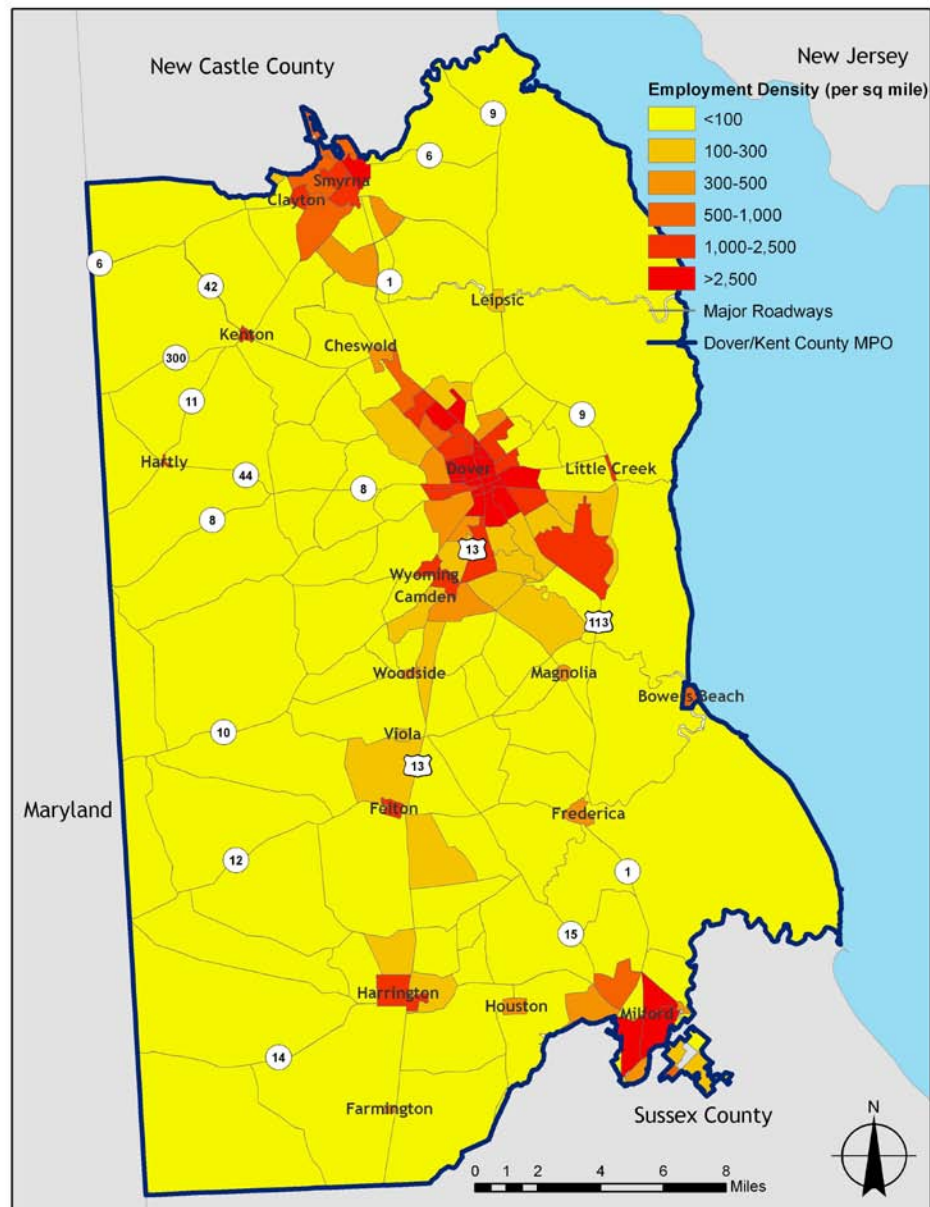
MPO Area by CCD	1990	2000	2005	2010	2015	2020	2025	2030	Percent Change 2005 - 2030
Central Kent County	834	2,699	3,030	3,093	3,155	3,310	3,374	3,439	14%
Dover Area	35,459	43,637	48,308	49,308	50,309	50,091	51,068	52,044	8%
Felton Area	1,470	2,533	2,823	2,881	2,939	2,991	3,049	3,107	10%
Harrington Area	3,978	1,807	2,023	2,065	2,107	2,183	2,226	2,269	12%
Kenton Area	483	440	496	506	516	547	557	568	15%
Milford Area	8,796	9,471	10,585	10,804	11,023	12,280	12,519	12,759	21%
Smyrna Area	4,183	6,019	7,398	7,552	7,705	7,900	8,054	8,208	11%
Total	55,203	66,606	74,663	76,209	77,754	79,302	80,847	82,394	10%

Source: Delaware Population Consortium, 2007 Projections

*Note: Milford and Smyrna figures include the Sussex County and
New Castle County portions of those municipalities.*

¹ <http://www.dover.af.mil/shared/media/document/AFD-061020-042.doc>

Exhibit 4.8: Dover/Kent County MPO 2030 Employment Density



Source: DelDOT

4.2 Goods Movement

The dominant means of goods movement in Kent County, as well as in Delaware overall, is trucks. Trucks move approximately 80 percent of manufactured goods to and from Delaware each year.

The main commodities shipped from Kent County in 2005 were nonmetallic minerals, chemicals, minerals, food, lumber, and farming materials. Most of the commodity flows from Kent County are transported to New Castle County, Delaware, and to the Pacific West and Midwest (East North Central) United States. As stated in the Dover/Kent County

MPO 2007 Transportation Information Booklet, "...in 2005 Kent County imported 4,305,215 tons of consumer goods, raw materials, and other precious commodities, with a total of 223,302 trucks hauling these goods into the county." Kent County receives more than one-third of its goods from New Castle County, Pennsylvania, and New Jersey.

According to the 2007 MPO Information Booklet, one in 15 vehicles, or 6.3 percent, on Kent County roads carries freight. By comparison, in 2001, the same 6.3 percent of the total annual average daily traffic (AADT) was heavy trucks. In Kent County, US 13 and 113 and SR 1 are major truck routes. US 13 is the principal freight transportation route for private and for-hire motor carriers in Delaware.

In Dover, McKee-Saulsbury Road is a designated truck route to serve the industrial areas on the west side of the city. High truck traffic volumes have also been recorded through Farmington, Felton, Woodside, Camden, Wyoming, Cheswold, and Smyrna. The only Kent County location identified as having low overhead clearance for trucks is SR 14 in Milford at the Mispillion River, the southern Kent County boundary.

The increase of truck traffic and truck dependence has resulted in issues of road capacity and safety. The growing number of trucks and truck miles has led to accelerated damage of the highway system, decreasing air quality, more noise, and an overall negative impact on our resident's quality of life.

In several areas throughout the state, shippers, carriers, and the community have made special efforts to direct trucks to designated routes. Ongoing development in the industrial area in southwest Dover increases truck traffic. The completion of Scarborough Road, connecting SR 1 with McKee-Saulsbury Road, has enhanced this truck connection to west Dover. The opening of a partial interchange at SR 1 and SR 8 has resulted in a decrease in trucks on SR 8 and US 13 and serves the shippers and manufacturers to the southeast of the City. In Milford, trucks originating at various industrial businesses on the northeast side of the city pass through the downtown district which is adding extra stress to roads and bridges and has the potential to damage historic structures. To address this concern, the municipality has posted signs limiting truck weight to 27 tons on NW Front Street to reduce the stress of trucks on infrastructure. In addition, the city continues to search for alternative routes and roads for trucks so they do not overwhelm the existing transportation enhancements.

4.3 Automobile Ownership

The continued development in Kent County has relied upon personal automobiles to meet residents' basic needs. Many factors contribute to this increase in dependence on automobiles, including decentralized development patterns, employment trends, and population growth, along with changing demographics, and income trends. These combined trends result in an increase in automobile ownership and the number of vehicle-miles traveled. **Exhibit 4.9** presents results from the Delaware Trip Monitoring System (DTMS) showing average number of vehicles per household. Since 2002, the average number of vehicles has increased from 2.0 to 2.5.

Exhibit 4.9: Average Number of Vehicles per Household by Year for Kent County

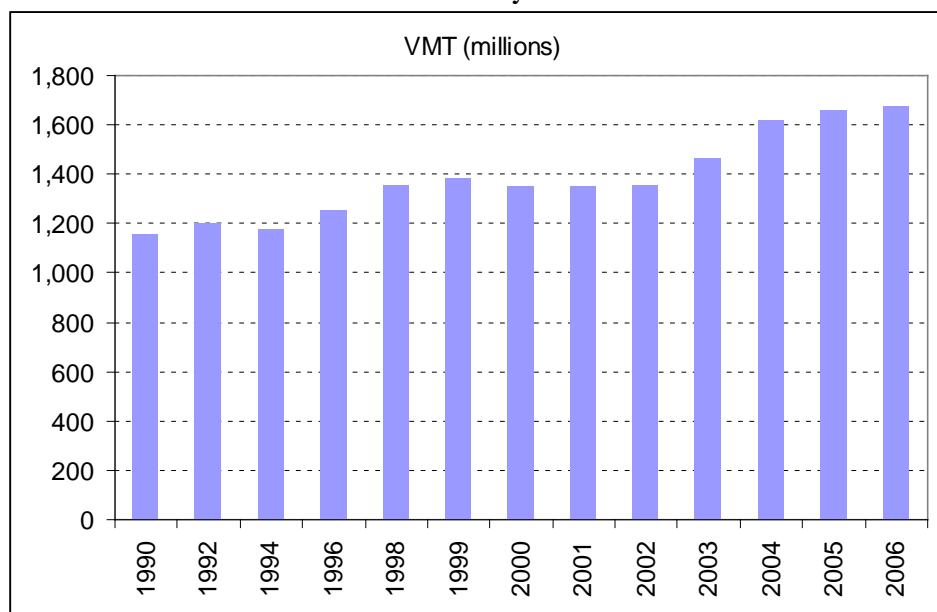
Year	Average Number of Vehicles
1997	2.2
1998	2.4
1999	2.3
2000	2.0
2001	2.1
2002	2.0
2003	2.3
2004	2.5
2005	2.5
2006	2.5
All Years	2.3

Source: Delaware Trip Monitoring System (DTMS)

4.4 Vehicle Miles Traveled (VMT)

Vehicle miles traveled (VMT) is defined as the total miles traveled by all vehicles for a section of roadway in a given amount of time. VMT is a key measure of roadway use. Within Kent County, vehicle miles traveled has increased due in part to the increase in vehicles per household. Just between 2003 and 2006, growth was from 1,466 to 1,680 million annual VMT, representing an annual increase of over 200 million VMT or an increase of 15 percent; far greater than the increase in population. In 2007, traffic in Kent County increased again to 1,699 million miles traveled, but at a slower, 1.3 percent annual rate, than in the recent past.

Exhibit 4.10: Kent County VMT Growth



Source: DelDOT

4.5 Daily Traffic Volumes (AADT)

Annual average daily traffic (AADT) on roadway segments is another indicator of degree of traffic. This indicator reflects the operations and performance of specific roadways. DelDOT has a system of permanent automatic traffic counters at locations throughout the state and publishes an annual report of the AADT's on all state roadway segments. **Exhibit 4.11** illustrates the AADT at DelDOT permanent counting stations in Kent County. These data indicate that the changes in roadway use vary substantially annually. Noticeable increases are observed from the 2002 to 2006 traffic counts. US 13, near Dover Downs carried more than 10,000 additional vehicles in 2006 compared with 2002, but less than in 1998. Similar rates of increase are noted on US 113 by the Milford Bypass and on US 113 by Court Street in Dover. The 2007 data indicate mixed changes, with the number of trips generally decreasing at these locations.

Exhibit 4.11: AADT and Percent Change, 1990-2006

ROAD	LOCATION	1990	1994	1998	2002	2006
US 13	Dover Downs	57,972	58,834	60,231	45,731	56,662
RD 88	NE of Dover	1,493	1,448	1,770	3,777	4,180
RD 195/ SR 15	SW of Dover	5,192	5,602	6,807	7,777	7,677
SR 8	W of Dover City Limit	8,516	10,003	11,580	12,019	16,371
RD 12	N of Leipsic	1,835	1,024	1,649	1,306	1,340
SR 9	SR 6	1,021	673	872	658	571
US 13	Court Street, Dover	27,373	29,121	33,398	36,854	38,905
US 113	Court Street, Dover	35,798	26,858	27,451	30,908	44,335
US 113	Milford Bypass, RD 8A	14,217	15,257	17,566	10,864	19,685
SR 1	Milford Bypass, RD 7	11,736	14,265	13,187	21,138	20,821

Source: DelDOT, 2006 Traffic Summary

4.6 Mode Choice

According to typical mode choice studies, the average distance threshold that a person will walk is 1.4 miles, and for biking, 5.8 miles. These thresholds are the average distance that people will travel by those modes for recreation, work, or school. Mode choices have become more important due to increases in the cost of fuel, insurance, parking, and ticket costs. A variety of mode choices provides a higher quality of life than a single transportation mode.

Overall mode choice in Kent County for 1990 and 2000 is shown in **Exhibit 4.12**. The predominant mode of choice is driving alone in a single-occupant vehicle. Carpooling is the

next largest mode of choice; however, the percentage of those who rode together slightly decreased from 1990 to 2000. The percentage of pedestrians and bicyclists also slightly decreased from 1990 to 2000.

Exhibit 4.12: Kent County Travel Mode Choice

Mode/Year	1990	2000
Drove Alone	77.7%	79.7%
Carpooled	14.4%	12.9%
Public Transportation	0.6%	0.8%
Bicycled or Walked	3.4%	2.5%
Motorcycle or Other	1.1%	1.0%
Worked at Home	2.8%	3.1%

Source: 2000 Census Transportation Planning Package Data for Dover/Kent County MPO

4.7 Through, Regional, and Local Trips

Trips can be classified into three types (through, regional, and local) based upon the origin and destination of the trip.

- Through trips neither originate nor terminate in Kent County or the state.
- Regional trips include those that originate in one county of Delaware and terminate in another county or out-of-state.
- Local trips originate and terminate within the same county. Local traffic may use all types of roadways.

An understanding of the local, regional, and through-trip characteristics that predominate certain corridors and trip types can guide appropriate investment strategies. The needs of and conflicts created by these different trip types require specific strategies and actions. The separation of through traffic from local traffic is critical to efficient system performance and user satisfaction. For example, US 13 through Dover carried approximately 9 percent through trips, 49 percent regional trips, and 42 percent local trips in 1995. The predominance of local trips on this major corridor has resulted in congestion. The SR 1 bypass around Dover was constructed to relieve some of the through and regional trip needs that were competing for capacity with local trips on US 13.

4.8 Travel Trends and Customer Satisfaction/Public Opinion

4.8.1 Travel Trends

The Delaware Travel Monitoring System Survey, as part of the Delaware Statewide Model Improvement Project, is an ongoing survey designed and conducted since 1995 by the Center for Applied Demography and Survey Research (CADSR) at the University of Delaware. In a random process, respondents are selected and asked to list the origin, destination, time, and trip method (mode) of every trip made in the preceding day. Demographic data is compiled for each respondent and public opinion on transportation issues is also obtained. Approximately 2,000 surveys are completed monthly with 700 of those done by residents of Kent County.

According to the results of the Delaware Travel Monitoring System, no significant changes occurred in travel patterns in Kent County. While most of the changes are not significantly

different from 1996, a noticeable increase in the number of trips per person has occurred, as shown in **Exhibit 4.13**. For instance, while there were 1.8 trips per person in 1999-2001, that number grew to 3.0 trips in 2004-2006. This increase occurred across all groups, with the biggest growth occurring in the 35 to 44 age group and the 55 to 64 age group, as seen in **Exhibit 4.14**.

Exhibit 4.13: Average Trips per Person per Weekday by Year

Years	Average Trips per Person
1997 – 1999	2.2
1998 – 2000	2.1
1999 – 2001	1.8
2000 – 2002	2.0
2001 – 2003	2.4
2002 – 2004	2.6
2003 – 2005	3.0
2004 – 2006	3.0

Source: DTMS

Exhibit 4.14: Average Trips per Person per Day by Age Grouping

Age Group	2000-2002	2001-2003	2002-2004	2003-2005	2004-2006
16 to 24	2.1	2.3	2.4	2.5	2.5
25 to 34	2.3	2.7	2.8	3.1	3.1
35 to 44	2.2	2.5	2.7	3.2	3.3
45 to 54	2.0	2.3	2.5	3.1	3.2
55 to 64	1.7	2.3	2.6	3.0	2.9
65 and older	1.3	2.0	2.4	2.8	2.6
All ages	2.0	2.3	2.6	3.0	3.0

Source: DTMS

Exhibit 4.15 shows average trips by type of residential area. As expected, most automobile trips occur in the suburban areas. Furthermore, suburban commuters are the ones who have seen the biggest increase in the number of trips per person, growing from 2.1 trips in 2000-2002 to 3.1 trips per day in 2004-2006. The rural and urban commuters follow a very similar trend in Kent County: while the number of trips per person has grown, they did not increase as much as for the suburban residents. The increase in the number of trips is a major contributor to green house emissions even with no population growth. As experienced in other regions around the state and the country, average travel time to work has increased over the past 10 years as well. For Kent County, it has grown from 20.5 minutes in 1997 to 25.2 minutes in 2006, as shown in **Exhibit 4.16**.

Exhibit 4.15: Average Trips per Person per Day by Type of Area

Type of Area	2000-2002	2001-2003	2002-2004	2003-2005	2004-2006
Urban	2.3	2.3	2.6	2.7	2.8
Suburban	2.1	2.3	2.5	3.0	3.1
Rural	2.1	2.2	2.4	2.7	2.9

Source: DTMS

Exhibit 4.16: Trip Time in Minutes by Year

YEAR	Trip Time
1997	20.5
1998	20.6
1999	22.2
2000	25.4
2001	22.7
2002	21.2
2003	24.2
2004	23.5
2005	24.1
2006	25.2
1997 thru 2006	23.0

Source: DTMS

4.8.2 Customer Satisfaction Survey/Public Opinion

DelDOT routinely conducts a Customer Satisfaction Survey of the traveling public, including businesses that ship and receive goods, to determine how well the Department is meeting transportation needs. The survey considers all modes that move people and goods. These survey results are used to better understand what features of the transportation system are most important to system users. In addition to trends and analysis, the survey helps to identify the needs of system users. This section reviews the satisfaction of Kent County residents and their opinions as compared to the rest of the state.

Customer Satisfaction Surveys were first conducted in 1997 and are repeated annually to obtain trend data. The survey data are used as inputs into the Department's progress monitoring program. In 2006, the latest available, four different user groups were surveyed as part of this study. These user groups represent some of the different customer segments served by the Department. The first and largest survey, known as the General Transportation User Survey, was a random statewide telephone survey of 1,202 Delaware residents age 16 years and older. This survey was conducted in each of the previous survey years.

The second survey conducted in 2006 was a random statewide telephone survey of 100 Delaware residents age 16 years and older. This survey was directed at residents that reside in the transit-served areas of Delaware, but whom had not taken transit during the previous month. This survey was also conducted in the previous survey years. This survey is entitled the Transit-Served Market Area Survey.

All respondents were asked to rate Delaware's transportation system as a whole, and the 2006 results indicate that 61 percent of respondents think that the transportation system as a whole is meeting their needs "very well" or "somewhat well." This is similar to the 2000 and 2005 survey results but lower than results from other survey years. **Exhibits 4.17 and 4.18** show the data by county of residence.

Exhibit 4.17: Satisfaction Level by Transportation Type (2006) – General Transportation User Survey

	New Castle		Kent		Sussex	
	Very or Somewhat Well	Not Too or Not at All	Very or Somewhat Well	Not Too or Not at All	Very or Somewhat Well	Not Too or Not at All
Roadways	86%	14%	92%	8%	87%	13%
Transit	68%	32%	75%	25%	69%	31%
Bicycle	100%	0%	70%	30%	40%	60%
Pedestrian	78%	22%	67%	33%	55%	45%
Overall	76%	24%	81%	19%	76%	24%

Source: DelDOT Customer Satisfaction Survey

Exhibit 4.18: Satisfaction Level by Transportation Type (2006) – Transit-Served Market Area Survey

	New Castle		Kent		Sussex	
	Very or Somewhat Well	Not Too or Not at All	Very or Somewhat Well	Not Too or Not at All	Very or Somewhat Well	Not Too or Not at All
Roadways	95%	5%	94%	6%	90%	10%
Bicycle	100%	0%	0%	0%	0%	0%
Pedestrian	75%	25%	100%	0%	67%	33%
Overall	67%	33%	65%	35%	45%	55%

Source: DelDOT Customer Satisfaction Survey

It appears that Kent County residents are more satisfied with their roadway network and the transit network than are residents of the other two counties. At the same time, New Castle County outperforms Kent County in its residents' satisfaction with the bicycle and pedestrian facilities in their respective counties.

4.9 Existing Land Use

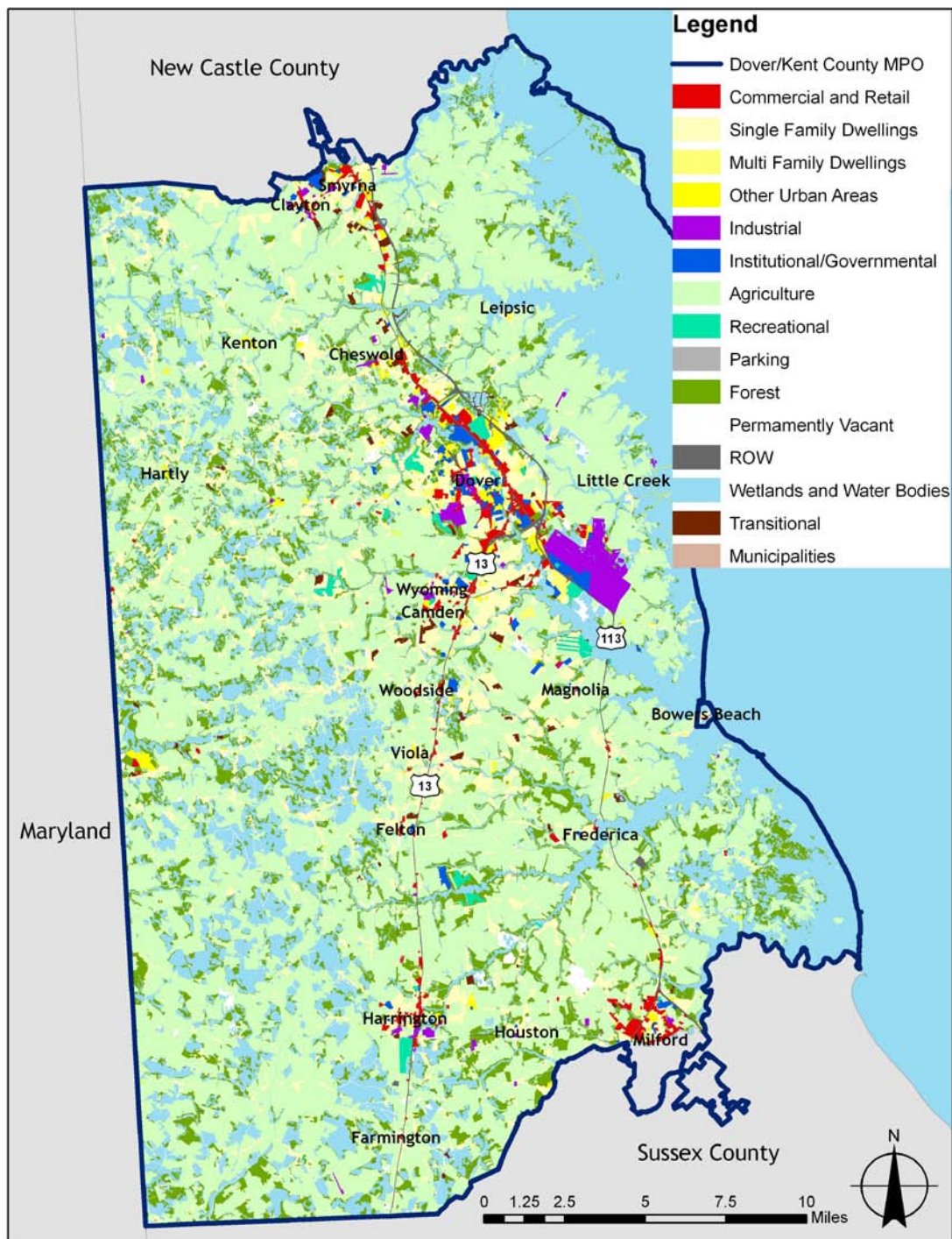
Existing land use plans indicate that Kent County is predominantly agricultural and environmentally-sensitive land, as seen in **Exhibit 4.19**. The next largest land use is single family residential. Within Kent County, mixed land uses are concentrated in cities and towns and along routes US 113 and SR 13 and sprawling outward..

Exhibit 4.19: Existing Land Use

Land Use	Acres	Percent of Total
Agriculture	222,433	47.8%
Permanently Vacant – Environmentally-Sensitive	174,614	37.7%
Single Family Residential	40,722	9.0%
Commercial	6,723	1.5%
Vacant	6,314	1.4%
Industrial	3,749	0.8%
Government/Institutional	2,413	0.5%
Multi-family Residential	2,148	0.5%
Streets/Right-of-Way (ROW)	2,508	0.5%
Public Open Space	2,000	0.4%
Common Parking	21	0.01%
Total	463,645	100.00%*

*Numbers may not add to 100% due to rounding

Exhibit 4.20: Kent County Existing Land Use (2002)



Source: Delaware Office of State Planning

4.9.1 Current Land Use Situation

Since the previous Kent County Comprehensive Plan, the county has experienced a tremendous amount of growth. Approximately 26,000 residential lots were approved in the

county during the period through August 2007. More than 50 percent of those lots have either been built or have been issued a building permit. The county had not provided adequate infrastructure, including transportation, to accommodate the growth that has already occurred. Instead, the County required land developers install what was needed where possible.

Growth in Kent County has outpaced infrastructure investment from all sources, however. Many of the local roads within growth areas are not currently improved to their functional classification and cannot support additional development. Before additional development is permitted, the county, in conjunction with DelDOT and the MPO, must develop a plan for upgrading roads to their identified functional classification.

The Kent County Comprehensive Plan has put an emphasis on providing adequate infrastructure as well as a variety of nonresidential services, both public and private, for existing, planned, and anticipated residential development within growth areas. The County placed an emphasis on further refining the county's growth boundaries to serve two primary purposes: (1) efficiently directing public investments in infrastructure of all types, and (2) protecting the county's agricultural industry and natural resources from encroaching development.

The Delaware Corridor Capacity Program is designed to maintain the regional importance and preserve the capacity and function of existing participating routes. The program, in large part, is designed to maintain an existing road's ability to handle traffic efficiently and safely. Currently SR 1, US 13, and US 113 in Milford are routes within the MPO area that are included in the program. The goals of the program are accomplished through preventing unnecessary new entrances and driveways, minimizing the need for traffic signals, and providing for local service roads. The program relies on the purchase or dedication of access rights, purchase of development rights, purchase or dedication of easements, and fee simple acquisitions as implementation methods.

Routes currently in the program are primarily north-south oriented. An east-west route needs to be preserved as well, not only to serve residents but also business-related truck traffic. The east-west routes to consider for the program include SRs 8, 10, and 12.

Individual plans and ordinances control the current land use in municipal jurisdictions in Kent County. Dover has had new growth pressures and development conditions since the 1990s and the MPO and DelDOT have worked with the City to identify transportation improvements needed to accommodate these new developments. The South State Street Land Use and Transportation Plan identifies existing land use from Little Heaven to US 13 and points of existing inadequacies. This study projects possible future land use development scenarios and foretells of future inadequacies of the transportation system. Currently, in most of the corridor there is a lack of accommodations for bicycles and pedestrians. The DE 8 Concept Plan and Operations Study identified potential development and redevelopment plans along this corridor. This area is within the Corridor Overlay Zone described in the City of Dover's Zoning Ordinance. The Camden Comprehensive Plan identified areas of potential development expansion to the south of Camden along US 13A and SR 10. Camden's close proximity to Dover makes it likely that development will occur between the town and city. The land use along US 13 will continue to enjoy pressure for commercial development.

The Kent County Comprehensive Plan introduces the concept of Transportation Improvement Districts (TIDs, further discussed in Chapter 5) as a means of encouraging growth in specific areas of where comprehensive, multimodal transportation system improvements may be developed.

4.10 Land Use Trends and Analysis of Growth Scenarios

There is a causal link, a positive feedback loop, between Transportation and Land Use. Land use patterns greatly influence regional travel patterns. In turn the degree of access provided by the transportation system can influence land development patterns. Transportation planners must make every effort to consider the comprehensive land use plans of the region and local jurisdictions and collaborate with land use planners while developing Long Range Plans. According to the Federal Highway Administration (FHWA) regulations for metropolitan and statewide planning, the metropolitan planning process should consider the following with respect to land use and transportation planning:

- The likely effect of transportation policy decisions on land use and development and the consistency of transportation plans and programs with the provisions of all applicable short- and long-term land use and development plans.
- The area's comprehensive long-range land use plan and metropolitan development objectives; national, state, and local housing goals and strategies; community development; and employment plans and strategies.

(citation?)

Comprehensive plans for Kent County, the City of Dover, Smyrna, and Milford, plans for virtually all jurisdictions in the county, have been reviewed to incorporate elements of existing and planned land uses in the region.

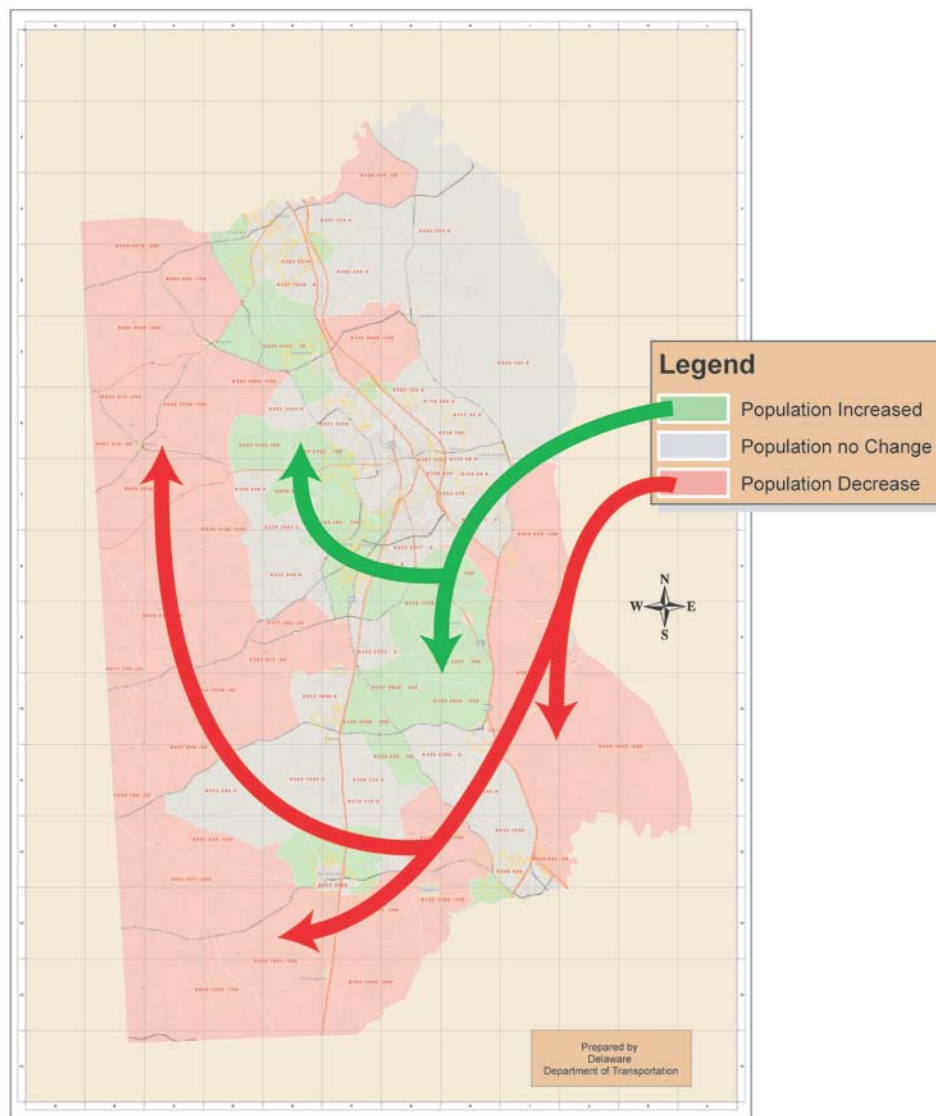
4.11 Land Use Scenarios

The DelDOT transportation model relies on population and employment forecasts developed by the Delaware Population Consortium as a basis for estimating the number of trips made in the year 2030. These estimates are derived from the Delaware Population Consortium's data using the Livable Delaware-based growth scenario. This scenario reflects adopted policy directives to concentrate future growth within a specified Growth Area, which is described in the 2004 Strategies for State Policies and Spending. The intent of Livable Delaware and the State Strategies is to concentrate growth in areas which are already developed and contain sufficient infrastructure to support further development, while discouraging growth in more rural areas outside of the Growth Area to attempt to preserve undeveloped land for other uses.

In addition to the Livable Delaware supported scenario, a more aggressive "Shift Scenario" has been assessed which further concentrates future development within the Growth Area for Kent County. This scenario allows for comparison of travel conditions associated with even greater concentrations of growth within already-developed areas. Both scenarios presume the same amount of overall growth in the Dover/Kent County MPO between today and 2030. Dover/Kent County MPO's population is estimated at 146,962 in 2005, and is forecast to grow to 205,535 by 2030. This projected net increase of 58,573 new residents is a 40 percent increase over today's population.

The Shift Scenario adjusts the baseline Livable Delaware 2030 scenario by reallocating approximately 3,700 of the projected 58,573 new Kent County residents from areas outside the Growth Area to TAZs inside of the Growth Area. Approximately 3,000 persons are redistributed from areas on the western side of Kent County, while 700 are drawn from areas to the east. **Exhibit 4.21** portrays the results of these changes. These areas are in, adjacent to or near existing cities and towns (municipal jurisdictions) and correspond to growth area plans identified in comprehensive plans throughout the county. Decreases in population would be from agricultural and preservation areas.

Exhibit 4.21: Areas with Shifts in Population



Source: DelDOT

4.12 Assessing Future Transportation Needs

Kent County currently is being developed at a pace that will create conditions that will require State interdiction. Many of Kent County's roads are not currently improved to their

functional classification. As a result, existing demand is not being satisfied and anticipated demand from approved but unbuilt residential lots cannot be accommodated. Further development along insufficient roadways should not be considered. The areas where infrastructure is not adequate for demand is where transportation improvements and land use controls must be a priority.

4.12.1 Travel Demand Analysis

To develop travel demand forecasts that would identify transportation system deficiencies, it was necessary to generate traffic volumes to represent:

- Existing conditions (2005)
- Projected (2030) “Base” conditions, including transportation improvement projects programmed through 2013
- Projected (2030) “Shift” conditions with transportation improvement projects programmed through 2013 **and** a shift of population to growth areas

4.12.2 Travel Demand Analysis Methodology

The traffic volumes were calculated and assigned to the roadway network by means of DelDOT’s TRANPLAN computer model of Kent and Sussex counties. The model uses a three-step process. Demographic data is used to determine how many trips are generated or attracted by each TAZ (see Appendix for a more detailed map of the TAZ), and the TAZ to which each trip is destined. Trips are assigned to paths along the highway network based on minimal path travel times, forming link volumes. The minimum path between zones is calculated on the basis of link length, highway type, and link volumes.

The MPO member governments generally have developed land use policies intended to manage demand for public services by managing growth. Those efforts, and those of Kent County, culminated in the adoption of the Kent County Growth Zone map and the Cabinet Committee on State Planning Issues’ *Strategies for State Policies and Spending*. These documents combines form the structure of Livable Delaware. The policies attempt to discourage, and are in reaction to, the negative impacts of sprawl, which requires travel by private automobile, increased daily trips and increased vehicle miles traveled, all contributing to decreased air quality. Sprawl places greater demand on the transportation system, requiring more costly public investment in maintenance and possible expansion of existing facilities and increased travel costs for residents. Consequently, the policies of the County and the included jurisdictions encourage growth in areas close to existing infrastructure. Mechanisms vary among communities but most utilize a facilitated development process and public funding to encourage appropriate development.

The modeling process used involved receiving “Base Scenario” (also referred to as Livable Delaware Scenario) and “Shift Scenario” population data for Kent County Traffic Analysis Zones from the Dover/Kent County MPO and Kent County Planning Department. The population data was utilized by the DelDOT travel demand model. Results from the model were compared on volume, speed, level of service, and emissions for each model run.

4.12.3 Projected Travel Conditions

Level of service (LOS) is an assessment of roadway and intersection congestion levels, expressed as LOS A through LOS F. LOS A is defined as free-flow; LOS E is defined as using all available capacity; and LOS F is defined as exceeding available roadway capacity. In

adopting the Adequate Public Facilities Ordinance for roads, Kent County adopted a minimum LOS of C for all roads in an effort to ensure that adequate road capacity is maintained for new development.

Kent County's Land Use Map designates specific areas for development in an effort to concentrate investment in infrastructure. In order to direct development in keeping with the Land Use Map, the level of service within growth areas should be established at LOS D while maintaining LOS C outside of growth areas. Kent County has established LOS D in growth areas that are more urban and suburban because LOS C cannot be achieved during peak hours, resulting in the pushing of development outward from designated growth areas to rural areas. The design LOS for areas outside the growth zone are expected utilizing controlled development, not building capacity enhancements.

Several corridor plans and studies have been conducted in Kent County. As part of these studies, a future LOS was determined for specific routes in the county. The DE 8 Concept Plan and Operations Study determined future (2030) LOS at the intersections of Saulsbury Road and Kenton Road to be LOS F and E, respectively. On South State Street the existing (2005) LOS during peak hours is between C and F. The ongoing North Dover Study projects failed intersections and roadways without significant investment by 2030.

4.12.4 Alternatives Analysis

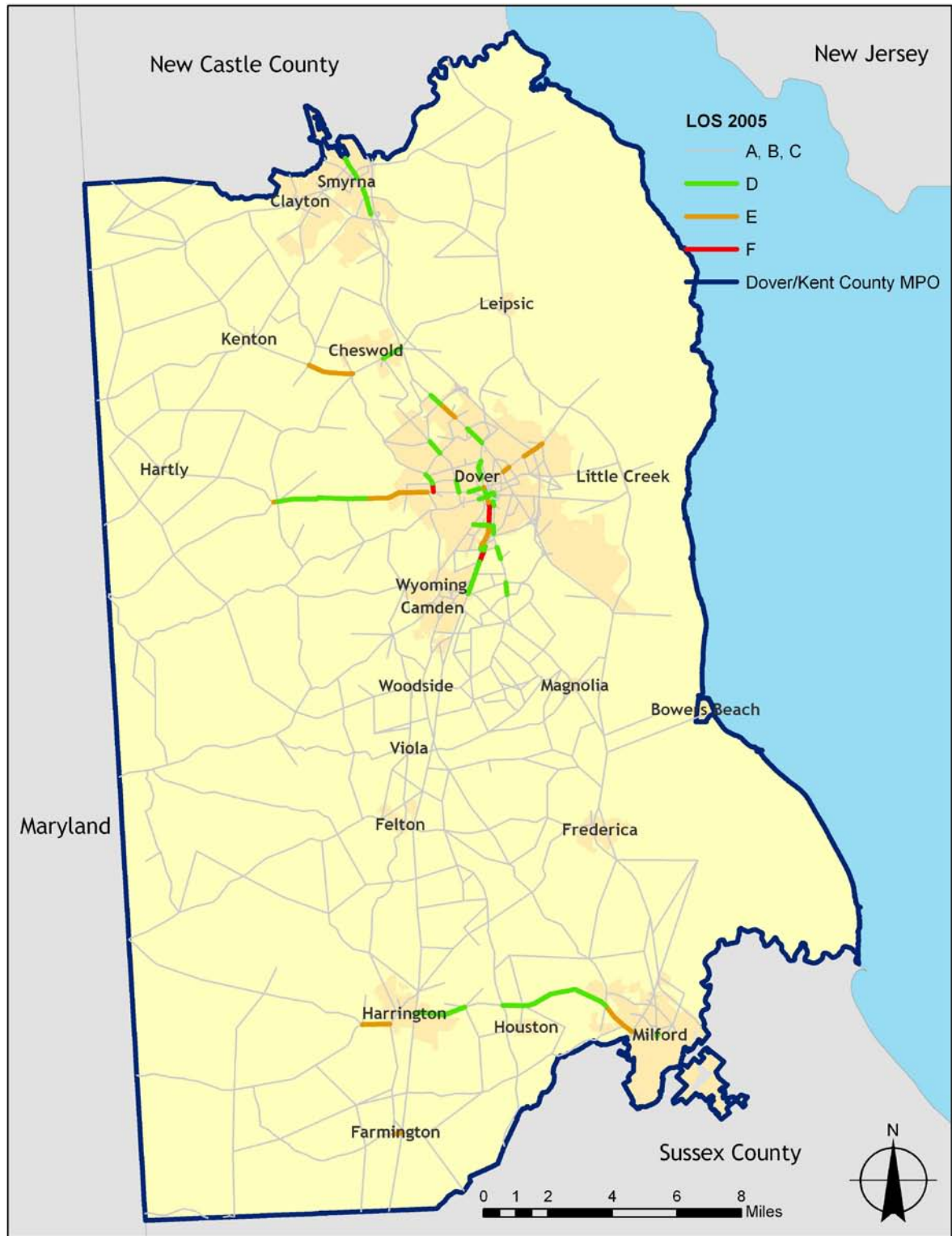
Travel demand projections from the Dover Plan Update indicate that though the majority of the transportation system operates effectively today, significant congestion is likely to occur. Several segments of roadway in and near Dover will be deficient by 2030, as seen in **Exhibit 4.23**. Also, with the "Shift" Scenario, there are segments where the LOS would be worse than the "Base" Scenario, as seen on **Exhibit 4.25**. Some of the travel demand may be addressed through the availability of several transportation modes. The exhibits on the following pages are introduced as:

Exhibit 4.22 displays the level of service in Kent County in 2005, the year used for comparisons. This illustrates that traffic congestion, as we all have experienced, is near urban and suburban areas particularly in the Dover area, Milford, and Smyrna. The worst congestion is in the City of Dover. Only two short segments of roadway show LOS F, however.

Exhibit 4.23 illustrates future LOS of the 2030 "Base" Land Use Scenario. This is the projected scenario that includes projects programmed through 2013 based on the Livable Delaware principles, but does not include projects from 2013 to 2030. The number of congested roadways is anticipated to increase on north-south routes that connect urban areas in the county and routes that provide for through traffic accessing the rest of the state. Routes 13, 113, and 1 experience the worst congestion.

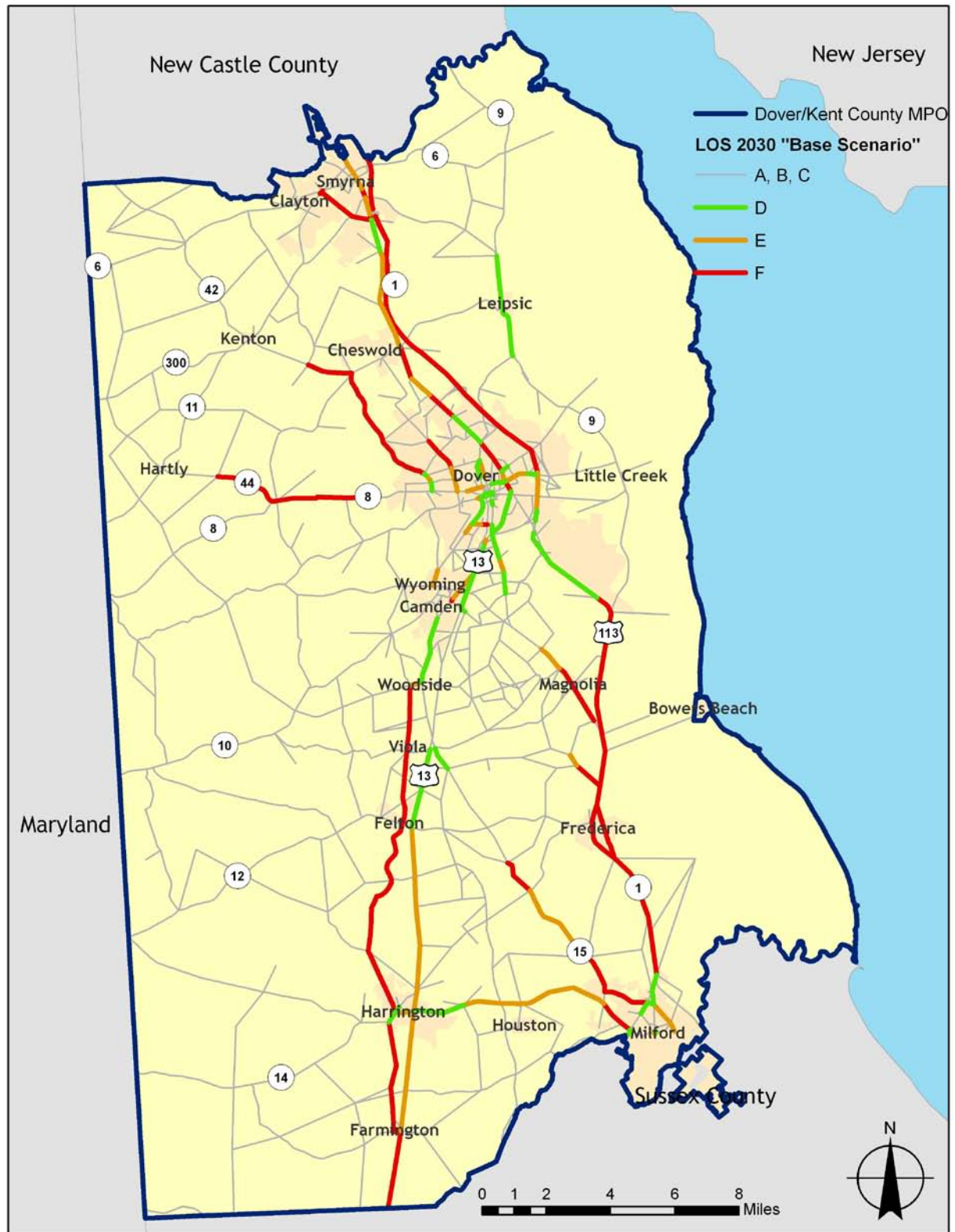
Exhibit 4.24 shows LOS with the proposed "Shift" scenario where populations are directed to core areas in the county, and also includes the projects programmed through 2013. **Exhibit 4.25** shows where changes to LOS would occur after the population shift. The difference between the "Shift" and "Base" scenarios is minimal. LOS is better in a few rural areas while LOS is worse in and south of Dover and in the town of Clayton.

Exhibit 4.22: 2005 Level of Service



Source: DelDOT

Exhibit 4.23: 2030 "Base" Scenario Level of Service



Source: DelDOT

Exhibit 4.24: 2030 "Shift" Scenario Level of Service



Source: DelDOT